



OSPREY COMBAT AIRCRAFT • 45



USAF F-4 PHANTOM II MiG KILLERS 1965–68



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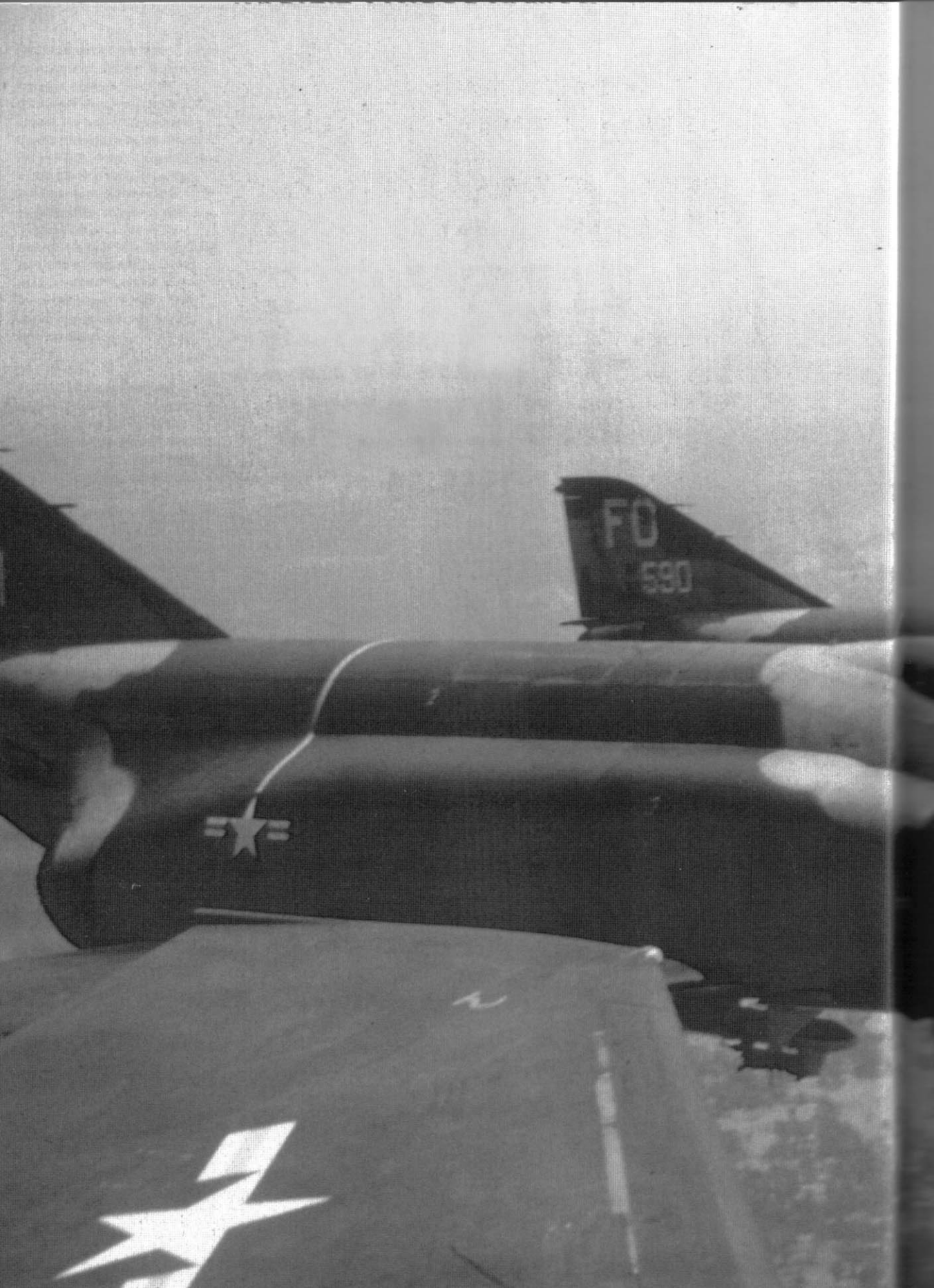
Peter E Davies

PETER E DAVIES is the co-author of the two Osprey Combat Aircraft titles on the US Navy's F-4 Phantom II MiG killers. He has written more than a dozen books on modern US combat aircraft, specialising in the service history of the F-4 Phantom II. Peter is a teacher by profession, and he lives with his family in Bristol. He is presently working on USAF F-4 Phantom II MiG Killers 1972-73, which is due for publication in 2005. This particular book is his third title for Osprey.

JIM LAURIER is a native of New England, growing up in New Hampshire and Massachusetts. He has been drawing since he could hold a pencil, and throughout his life he has worked in many mediums, creating artwork on a variety of subjects. Jim prefers to paint with oils on linen or canvas, with realism being the goal. He combines his love of history with his flying experiences to create some of the most realistic and historically accurate aviation paintings seen today. Indeed, technical accuracy and attention to detail have become the trademarks of his work. Jim uses a computer to digitally create many illustrations of aircraft and armoured fighting vehicles, bringing the same level of detail to his digital creations that has earned him a reputation as a fine artist.

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**US AIR FORCE
F-4 PHANTOM II
MiG KILLERS
1965-68**



SERIES EDITOR: TONY HOLMES

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OSPREY
PUBLISHING

Front Cover

'The MiG pilot had three choices', Brig Gen Robin Olds explained. 'He could bale out, hit that ridge of hills or pull up, giving my Sidewinder a clear shot. He chose the last option.'

On 20 May 1967, 8th TFW CO Col Olds led 'Tampa' flight, providing MiGCAP for an F-105 strike near Kep airfield. The MiGs were very active that month, and 16 attacked the strike force just short of the target. The subsequent battle lasted an unprecedented 14 minutes, during which time Col Olds' wingman was shot down ('The only wingman I ever lost', he recalled) and the MiGs entered a low-altitude, defensive 'wagon wheel' formation over Kep. After several attempts Col Olds and his 'GIB' ('Guy In Back'), 1Lt Steve Croker, got behind a MiG-17 and downed it with an AIM-7, despite heavy enemy fire.

As the strike force egressed, Col Olds saw a single aircraft orbiting low between the hills. 'I saw his shadow on the ground and there was no smoke trail, so I figured he was the MiG honcho, directing the others.' Having ensured that everyone else had safely departed, Olds turned back after the lone MiG. At extremely low altitude, and 'going like a stripe-tailed ape', he pursued the MiG-17 into a shallow valley with low hills at its end. As the MiG climbed to clear these, Col Olds destroyed it with his last Sidewinder and then swiftly departed.

'When I latched onto the tanker, we had about 300 lbs of fuel remaining.' Gen Steve Croker recalled that, 'The boss figured it perfectly. We hit our tanker and got the gas we needed pretty much on schedule'. He also remembered that they were out of missiles by that stage. 'We locked up and attempted to fire all of our AIM-7s, but I recall that one didn't come off the rail.'

Col Olds' mount on this mission was F-4C 64-0829, which he also flew during the attack on the Doumer Bridge that earned him an Air Force Cross, as well as the daring low-altitude strike on the Thai Nguyen steel mill (for which he was awarded a Silver Star) and on his final combat

First published in Great Britain in 2004 by Osprey Publishing
Elms Court, Chapel Way, Botley, Oxford, OX2 9LP

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ISBN 1 84176 656 9

Edited by Tony Holmes

Page design by Mark Holt

Cover Artwork by Mark Postlethwaite

Aircraft Profiles by Jim Laurier

Scale Drawings by Mark Styling

Index by Alan Thatcher

Origination by Grasmere Digital Imaging, Leeds, UK

Printed in China through Bookbuilders

04 05 06 07 08 10 9 8 7 6 5 4 3 2 1

EDITOR'S NOTE

To make this best-selling series as authoritative as possible, the Editor would be interested in hearing from any individual who may have relevant photographs, documentation or first-hand experiences relating to the world's elite pilots, and their aircraft, of the various theatres of war. Any material used will be credited to its original source. Please write to Tony Holmes via e-mail at: tony.holmes@osprey-jets.freeserve.co.uk

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mission – by then it had been named *SCAT XXVII*. On the 20 May 1967 mission it bore the 433rd TFS's 'Satan's Angels' insignia on its nose, beneath which Olds' and Croker's names were later added, together with their two kills on the left intake splitter plate (Cover artwork by Mark Postlethwaite)

Title page spread
MiG killer F-4D 66-7661/FO of the 8th TFW is seen on the prow over Vietnam in April 1968. It returned to the USA in 1981 after a long PACAF career, flying with the ANG's 113th TFW before going on display at Andrews AFB in January 1990 (via Peter Schinkelshoek)

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PREFACE

Tremendous advances in fighter design between the Korean and Vietnam War years introduced afterburners for speeds of up to Mach 2.5, radar and infra-red missiles to replace guns, coupled with long-range airborne radar to detect enemy aircraft so that they could be destroyed without the need for conventional aerial combat, and in-flight refuelling to extend range. Most fighters were also given a nuclear strike capability that endowed each aircraft with the destructive power of an entire World War 2 heavy bombardment group.

Epitomising all these trends, McDonnell's F-4 Phantom II quickly became the pre-eminent US fighter in South-east Asia. Operating with US Navy, Marine Corps and Air Force units, the aircraft flew countless attack missions in what was predominantly a bombing war. As a major contributor to over 100,000 air superiority sorties flown by American aircraft, it often faced supersonic MiG-21, transonic MiG-19 and subsonic, nimble MiG-17 defenders, flown with great determination under tight, Soviet-style ground control as part of a highly developed air defence system.

In practice, virtually all air combat was conducted at speeds below Mach 1.2 and altitudes below 20,000 ft. Most fights rapidly degenerated into visual, turning engagements in the 'primary manoeuvre region' (Mach 0.5 to Mach 1.0). High fuel consumption (quadrupled by the use of afterburner) and the F-4's limited turning ability kept these dogfights short. Long-forgotten skills in aerial combat once again became relevant, and World War 2 veterans like Eighth Air Force ace Col Robin Olds were luckily in place to reintroduce them. Within two years of the conflict starting in earnest, USAF F-4 crews were using pod-mounted guns to destroy MiGs. Conventional weapons such as the cannon, combined with old-fashioned cunning rather than cold technology, were employed to outwit the enemy in enterprises like Operation *Bolo*.

In all, despite many factors weighing heavily against their success, USAF F-4 crews claimed 107.5 enemy aircraft during the war, 59 of them prior to March 1968. This book explores the central role of USAF Phantom IIs during the aerial fights of the *Rolling Thunder* period, with many of the MiG-killing encounters of the time recounted by those who took part in them.

I am indebted to the following for sharing their experience and insights – Capt Bob Blake, USAF (Ret), Ben Backes, Tom Brewer, Robert F Dorr, Maj Ray Dudley, USAF (Ret), Michael France, Jerry Geer, Lt Col Bill Gordon, USAF (Ret), Capt Doug Hardgrave, USAF (Ret), Jay Hargrove, Chris Hobson, Alan Howarth, Don Jay, Col Klaus Klause, USAF (Ret), Jo Ann King, Maj Gen Don Logeman, USAF (Ret), Lt Col George H McKinney, USAF (Ret), Cdr Peter B. Mersky, Col Jack Morris, USAF (Ret), Brig Gen Robin Olds, USAF (Ret), Lt Col J R Pardo, USAF (Ret), Maj Gen Richard M Pascoe, USAF (Ret), George Pennick, Jim Rotramel, Peter Schinkelshoek, Col John Stone, USAF (Ret), Col James T Talley, USAF (Ret), Norm Taylor, Brig Gen Robert F Titus, USAF (Ret), Col Steve Wayne, USAF (Ret), Col Norm Wells, USAF (Ret), Col Ralph F Wetterhahn, USAF (Ret) and Brig Gen David O Williams Jr, USAF (Ret).

Above all, I am grateful to Col Ron Thurlow, USAF (Ret) for his invaluable support for this project.

Peter E Davies
Bristol
January 2004

FIRST FIGHTS

The Vietnamese Peoples' Air Force's initial complement of 36 MiG-17 and MiG-15UTI fighters was a gift from the Soviet Union, which had trained another 30 North Vietnamese pilots by mid-1965. Although this force was placed on alert status from 1 June 1964, its MiGs were not moved from their Communist Chinese training bases to North Vietnamese airfields until 6 August that same year, and these precious fighters were not launched against the earliest US air strikes on the North.

The small MiG force was initially deemed insignificant by the Americans, although initial US plans for attacks on North Vietnam included attacks on MiG bases. However, these were cancelled by Secretary of Defense, Robert McNamara. MiG pilots were thereby allowed to continue preparing themselves for battle with the American aircraft that they knew to be technically superior to their own MiG-17 'Silver Swallows'. They studied USAF and US Navy tactics, noting the strike formations' predictable ingress routes and the American fighters' lack of manoeuvrability when weighed down with heavy external fuel tanks and ordnance. They concluded that close-in gun attacks would force the US jets to jettison their war-loads and engage in defensive dogfights, where the MiG-17's exceptional turning capability could be used to advantage.

The VPAF 921st Fighter Regiment's first aerial victories were scored on 4 April 1965 when two 354th TFS F-105Ds were hit while they orbited their target with heavy bomb loads. Both pilots ejected and one drowned. The two MiGs evaded the F-100D fighter escorts and escaped.

Although it was the USAF's most numerous tactical fighter, the F-100's perceived failure to protect the F-105 bombers on 4 April (despite a 'probable' MiG kill by Capt Don Kilgus of the 416th TFS) meant that it was quickly withdrawn from escort duties over the North.

Col (later Brig Gen) David O Williams commanded the 522nd TFS and flew many escort and BARCAP sorties in F-100Ds from Takhli and Da Nang ABs at that time, occasionally sighting contrails from MiGs that chose not to engage. In his opinion;

'The F-4 was successful at fighting MiGs largely because of the high thrust from its J79 engines, its rapid acceleration to supersonic speed, its good radar and its radar-guided AIM-7 Sparrow missiles. The F-100 lacked all of these features.'

The Super Sabre's move to the ground-attack role was accelerated by the USAF's desire to prove its new McDonnell F-4C in combat. McDill AFB, in Florida, was home to the first USAF F-4 training unit, the 4453rd Combat Crew Training Wing, which formed on 4 February 1963 with some of the 29 F-4Bs (designated F-110As by the Air Force) it had loaned from the Navy prior to the arrival of the first F-4Cs on 20 November. The 4453rd CCTW trained the first two frontline F-4C wings (the 15th and 12th TFWs), which achieved Initial Operational Capability in October 1964.



This aircraft was one of the original batch of F-4C-22-MCs used by the 45th TFS during its detachment from the 15th TFW at McDill AFB to Ubon RTAB on 4 April 1965. Remaining in-theatre until August of that same year, the 45th TFS was the first USAF F-4 squadron to fly combat missions, and it scored the Phantom II's first two MiG kills on 10 July 1965. Return to the USA was followed by conversion to the F-4D in 1967 and FB-coded F-4Es the following year, before re-assignment to Alaskan Air Command in 1970. Late in 1965 buzz numbers, which had been carried aft of the *U.S. AIR FORCE* titling, were painted out, usually with a darker shade of grey paint. F-4C 64-0686 is seen here carrying a full complement of AIM-7D and AIM-9B missiles over the South Vietnamese coast (via Michael J France)

The 12th TFW's 555th TFS 'Triple Nickel' became the first squadron to deploy to the Pacific with the F-4C when it flew to Naha AB, Okinawa, in December 1964. However, the 45th TFS was the first unit to take the new fighter into combat, its F-4s detaching from the 15th TFW to Ubon Royal Thai Air Base (RTAB) on 4 April 1965. The 45th duly performed the first USAF Phantom II strike sorties and had scored the first two F-4C MiG kills by the time it returned to McDill AFB on 10 August 1965.

The squadron's aerial victories were both claimed on 10 July 1965 during a cleverly devised variation on the standard Phantom II-escorted F-105 strikes. The Vietnamese People's Air Force's fighter force, then still in training, had seldom intervened, and had already lost three MiG-17s to US Navy F-4Bs on 7 June (see *Osprey Combat Aircraft 26 – US Navy F-4 Phantom II MiG Killers 1965-70*).

On 10 July the VPAF pilots were deceived into thinking that a section of 45th TFS F-4Cs was the final flight in an F-105 formation. MiG pilots tended to pick on the last elements in a strike, as they knew the escort fighters would be low on fuel. On this occasion the four F-4Cs of 'Mink' flight had taken off 20 minutes later than usual and flown to the Yen Bai target area at 20,000 ft and 0.85 Mach, simulating a delayed F-105 flight.

'Mink' orbited the target several times before the MiGs rose, but on the final pass the F-4 element leaders ('Mink 01' and '03') made radar contact with VPAF fighters at a range of 33 miles. One F-4 had radar-searched 'high' and the other 'low', while the wingmen flew a weaving pattern behind them, making a visual search. As the Phantom IIs turned towards the MiGs, the element leaders, already low on fuel, made a visual identification (VID) of the MiG-17s and turned aside to allow 'Mink 02' and '04' to drop back and fire AIM-7D missiles at the correct minimum range. In fact, this manoeuvre did not allow enough safe separation to fire without hitting the lead F-4s, and the MiGs passed them head-on.

Drawn into a turning fight rather than the intended 'textbook' head-on AIM-7D interception, flight leader Maj Richard Hall and 'GIB' 1Lt George Larson, with Capts Harold Anderson and Wilbur Anderson in 'Mink 02', moved into an orbit outside the fight to watch for further hostile aircraft. The other two F-4s were soon under heavy gunfire, and 'Mink 03' (Capts Kenneth Holcombe and Arthur Clarke) used afterburner

to gain separation from the MiGs, while 'Mink 04' (Capt Tom Roberts and Ronald Anderson) split the enemy jets up so that one followed each Phantom II.

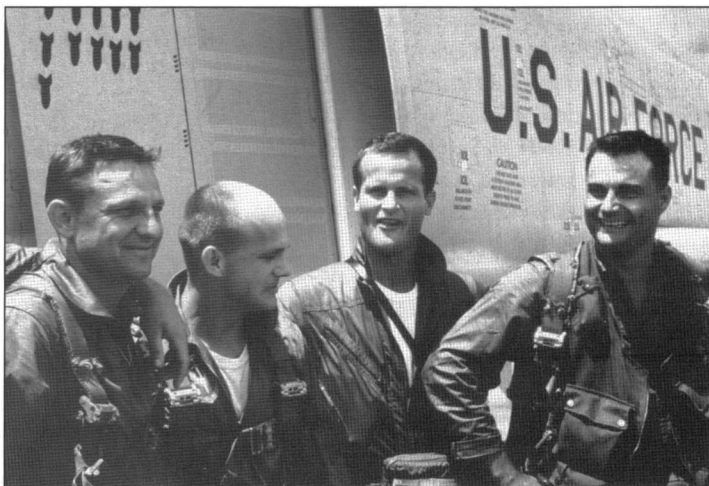
Holcombe dived away, losing his MiG, then climbed vertically over it, with his opponent attempting to follow. As the VPAF fighter ran out of energy, Holcombe reversed into it. He fired an AIM-9B Sidewinder (since his radar had malfunctioned) which failed, followed by three more, two without the correct launch 'tone'. Nevertheless, both Sidewinders detonated sufficiently close enough to the MiG to turn it into a fireball. Holcombe and Clarke's grey F-4C had scored the first USAF kill for the Phantom II.

Meanwhile, 'Mink 04' had also accelerated away from its MiG pursuer in a climb, leaving it several thousand feet below. Timing his manoeuvre carefully, Roberts turned back into his foe as the latter fell away in a descending turn. The American fired an AIM-9B at a range of one mile and it exploded close to the MiG's left wing tip, starting a fire in the rear fuselage. Three more Sidewinders followed and the fire intensified.

The engagement over, the F-4s diverted to Udorn RTAB, where one jet landed with only 275 lbs (120 kg) of fuel remaining aboard. Although the VPAF recorded no losses that day, two of the four 45th TFS crews were credited with a MiG-17 kill apiece.

For Phantom II pilots, this first combat proved the theories propounded in the Air Force's 1965 *Feather Duster* programme. The latter had matched USAF fighters against Air National Guard F-86H Sabres (as fair MiG-17 substitutes) and showed the folly of getting 'low and slow' in a turning fight. It also proved that most US fighters fought better at lower altitudes (although their missiles were less effective in the denser air), and helped to define the areas of their performance envelopes in which they would have the best chance against the MiG-17 and MiG-21.

Keeping the speed up enabled pilots to use 'energy manoeuvrability', rather than suffering the disadvantage of reduced lift in a high-g turn that left a steep dive as the only way of recovering that energy. American fighter pilots were advised to make fast, slashing attacks on the enemy, since MiGs generally had the advantage at speeds below 0.9 Mach. *Feather Duster* also cast doubt on the effectiveness of the USAF's 'fluid four' combat formation, in which two pairs (elements) of fighters supposedly gave mutual support



The first MiG-killing F-4C (64-0693), boasting 21 bombing mission symbols on its vari-ramp, provides the backdrop for two of the earliest USAF F-4 MiG killers, Capt Tom Roberts (left) and Capt Ronald Anderson (right). George Larson (second from the left) was 'GIB' for 'Mink' flight leader Maj Richard Hall. Capt Harold Anderson (centre) flew in 'Mink 02' (USAF via Robert F Dorr)

Lt Gen Joseph H Moore, 2nd Air Division Commander, awards Silver Stars to Capt Kenneth Holcombe and Maj Hall. Capt Arthur C. Clarke (centre) flew with Capt Tom Roberts (USAF via Robert F Dorr)



to each other. Each pair had a leader and a wingman, the latter flying behind and to one side in 'fighting wing' formation. The wingman's job was to stay with, and protect, his leader, who was also the 'shooter'.

Despite *Feather Duster* flights clearly showing that this formation would be ineffective against MiGs, the 'fluid four' (or 'welded wing' as some sardonically dubbed this rather inflexible arrangement) formation was retained throughout the war, the USAF resisting the adoption of the US Navy's more effective 'loose deuce', mutually supportive pairing,

where either fighter could be the 'shooter'. One obvious result of the 'fluid four' formation was that the majority of MiG kills were scored by flight or element leaders, who could concentrate on their shots while their wingmen protected them.

'WOLFPACK'

The third USAF wing to receive the F-4C was the 8th TFW, which had a long history of service in the Far East dating back to 1942. It became an F-4C operator when the recently reactivated 32nd TFW was redesignated the 8th TFW at George AFB, California, on 10 July 1964. When the wing moved to Ubon RTAB in December 1965, it took the 431st, 433rd and 497th TFSs with it. The 555th TFS joined the wing in March 1966 when it moved from the Cam Ranh Bay-based 12th TFW.

Col Joseph G Wilson commanded the 8th TFW as it established itself at Ubon, where the wing's primary task was to deliver bombs in *Rolling Thunder* missions – air-to-air combat had a low priority as a last resort if US formations came under attack from VPAF MiGs. In fact, the 'Wolfpack's' next commander, Col Robin Olds, described aerial combat as, 'a small, but necessary part of the air war'.

Some nine months elapsed between the two 45th TFS MiG kills in July 1965 and the first of twelve that were to be claimed in 1966. During that time little was seen of the VPAF, although US air forces suffered heavily from the rapidly expanding AAA and Soviet-operated SAM network in the North.

The MiG pilots had been withdrawn for intensive training following the July 1965 losses, the survivors working closely with the evolving, Soviet-style ground control system that guided them to their interceptions under the most favourable conditions. Many feint attacks were made, but the MiGs usually withdrew before escort fighters could engage them. The VPAF's MiG strength duly rose to 75 with the formation of the 923rd 'Yen The' FR at Kep in September 1965 and the introduction of the MiG-21 F-13 'Fishbed-C', equipped with two Sidewinder-based R-3S (designated K-13 'Atoll' in the west) missiles, at the end of 1965. From April 1966 examples of the more capable MiG-21PF 'Fishbed-D' also arrived in North Vietnam from the USSR.



Cruising over South Vietnam in 1965, this pair of F-4Cs is led by 63-7623. Repainted in camouflage, two years later it became a MiG killer for Maj Bob Pardo and 1Lt Steve Wayne. Wing aircraft 63-7664 was a 1966 casualty for the 555th TFS (*National Archives/KVT*)



By early December 1965 the 'Wolfpack's' 431st TFS was flying a mixture of grey and TO-1-1-4 camouflaged F-4Cs. The unit transferred to the 479th TFW on 6 December 1965
(National Archives/KVT)

pilots to jettison their ordnance and concentrate on self-defence was enough to negate its purpose.

Usually, a pair of MiGs was launched when a US strike force was detected on radar over the Laos/Thai border, followed by a second pair when the American force had advanced to within 60 miles of Hanoi. This tactic evolved into the use of two pairs – a 'high' pair to make an initial attack and disrupt the formation with a diving attack and a 'low' pair that climbed, often undetected, from below to make a follow-up attack. Sometimes a third element was also added at medium altitude.

By April 1966, MiG regiments were able to offer substantial resistance to US strikes, which had been renewed with greater intensity the previous month.

The MiG-21 had first been sighted on 15 January 1966, and the new fighters attempted to hit a U-2 and an F-105 in February and March. They also threatened the crucial Douglas EB-66s that jammed North Vietnamese defence communications in the target area, although the first actual loss of such an aircraft to a MiG-21 did not occur until 14 January 1968.

One such attack resulted in a fight with two MiG-21s on 23 April 1966, when the 555th TFS's 'Denver' flight of F-4Cs was providing a MiG screen between an EB-66 orbiting over 'Thud Ridge' (north-east of Hanoi) and likely aerial threats. Detecting a MiG-21 approaching the jamming aircraft, 'Denver 01' and '02' headed off in pursuit after the EB-66 had escaped. The two Phantom II crews attempted to fire six AIM-7D and AIM-9B missiles during the course of the engagement, but none of the weapons guided correctly. In one case the armourers had failed to connect the AIM-7D's ejector mechanism to launch the missile!

However, that same day the 555th TFS began its long run of success as the 'MiG Masters' squadron. Flying a four-ship fighter screen for an F-105 strike on Bac Giang, the flight leader pushed ahead to VID a radar contact they had acquired at 15 miles range. The No 3 F-4 (crewed by Capt Max F Cameron and 1Lt Robert E Evans) and its wing aircraft (crewed by Capt Robert E Blake and 1Lt S W 'Dub' George) manoeuvred into a firing position on the formation – two flights of four MiG-17s.

Meanwhile, the flight leader and the No 2 crew each fired an AIM-7D, which disrupted the MiGs. 'Denver 02' then got separated and was set upon by three MiGs, forcing Blake and Cameron to leave good 'kill' opportunities to rescue the No 2 crew, which was weaving through streams of cannon fire.



Capt Max Cameron (left) and 1Lt 'Dub' George take a break. They shared in the first 'Triple Nickel' MiG kills on 23 April 1966 (via Doug Hardgrave)

Cameron quickly loosed off an AIM-9B that flew up the leading MiG's tailpipe and destroyed its engine. As he focused on the second MiG, Cameron was in turn threatened by another 'Silver Swallow'. He and Blake duly performed a climbing separation manoeuvre that the MiG pilot could not follow. Blake then made a diving roll after the VPAF jet, firing a pair of AIM-7Ds as the North Vietnamese pilot fled to lower altitude – the second Sparrow fatally damaged the MiG-17.

The MiG-killing F-4C (64-0689) flown by Cameron and Evans was

subsequently lost on 2 May 1967 when an engine fire developed during the jet's take-off run from Cam Ranh Bay. Although the pilot aborted his departure, the machine (assigned to the 558th TFS/12th TFW) was damaged beyond repair.

Three days after the 23 April 1966 MiG-17 kills, USAF pilots scored their first MiG-21 victory, although several 'Fishbeds' had already been lost when they ran out of fuel after lengthy battles with US fighters. Maj Paul J Gilmore and 1Lt William T Smith of the 480th TFS/35th TFW were flying an EB-66 escort from Da Nang AB, in South Vietnam.

Gilmore and his wingman detected two MiG-21s approaching head-on, and they advised the EB-66 to leave the area. Jettisoning their wing tanks in preparation for combat, the two flights of fighters passed each other in afterburner and the F-4Cs reversed and dived to 12,000 ft. The lead MiG began a gentle descent from 30,000 ft before heading home, leaving his wingman to fly a series of shallow turns, apparently oblivious to the presence of the prowling Phantom IIs. Gilmore released a single AIM-9B that skimmed past the MiG, prompting its pilot to eject. A faulty radio then prevented Gilmore from being told by his wingman that his foe had indeed abandoned his fighter, the former closing to within 3000 ft of the pilotless MiG before he launched two more Sidewinders to clinch the kill.

Gilmore almost racked up a second victory when the lead MiG-21 returned to the fight as both F-4Cs followed the tumbling 'Fishbed' earthwards. Pulling up into the second VPAF fighter, Gilmore fired his last AIM-9B and it passed over the MiG's delta wing but failed to detonate. Low on fuel, the F-4 crew headed home to paint a red star on their jet's left vari-ramp.

Three days passed before the Phantom II's next victories, and once again it would be the 555th TFS who would claim the kills when a MiGCAP F-4C flight encountered four MiG-17s during a Thunderchief strike on Bac Giang Bridge. Capt William Dowell and 'GIB' 1Lt Halbert Gossard quickly despatched one of them with an AIM-9B, prompting flight leader Capt Larry Keith (with 1Lt Robert A Bleakley) to separate from his own flight to cover them.

Spotting a MiG closing on Gossard's F-4, Keith fired a Sidewinder at long range to scare it off. He then accelerated to catch up with the VPAF

jet, and at a range of 6000 ft his second AIM-9B began its 'rattlesnake' buzz to indicate that it had detected its target. The engagement took both fighters down to 2500 ft, with the MiG pilot performing some drastic evasive manoeuvres. His final ploy was to roll inverted, possibly to try a 'split-S', but he lost control and his MiG exploded when it hit the ground. Keith and Bleakley were subsequently awarded one of the few USAF F-4 MiG kills attributed to 'manoeuvring'.

'Triple Nickel' nailed another MiG the following day (30 April) when a RESCAP (Rescue Combat Air Patrol) element of two F-4Cs was attacked by four MiG-17s. Six US aircraft had been shot down in the preceding 24 hours, and the Phantom IIs were attempting to cover the rescue effort for downed RF-101C pilot Maj Albert Runyan. Determining that one of the F-4 elements in 'Bango Alpha' flight was off station refuelling from a tanker, the VPAF MiG controllers timed their attack to coincide with the remaining two orbiting fighters' approaching 'bingo' fuel state – by then the rescue had been aborted because of bad weather.

Despite minimal fuel and reduced visibility, Capt Lawrence Golberg and 'GIB' 1Lt Doug Hardgrave were able to position their F-4C ('Bango Alpha 04') behind one of the MiG-17s and fire a missile, which hit the VPAF fighter. Doug Hardgrave recalled;

'We were carrying four AIM-7Ds (AIM-7Es had not yet arrived in-theatre), four AIM-9Bs and three tanks. There were no ECM pods in our unit then. We punched off the tanks when the intruders were identified as MiGs. One AIM-9B was fired from dead "six o'clock" at one mile and an altitude of about 1500 ft. The pilot had a good 'chute. It looked as if the missile may have blown him out of the jet and his seat worked automatically. The MiG was in metallic finish, with red markings. When he attacked us, the bullets coming out of his guns looked like orange fireballs.'

They rejoined with aircraft 'Bango Alpha 03' (Capt Bob Walmsley and 'Dub' George, on a practice flight lead mission) and made it to Udorn with only four minutes of fuel left.

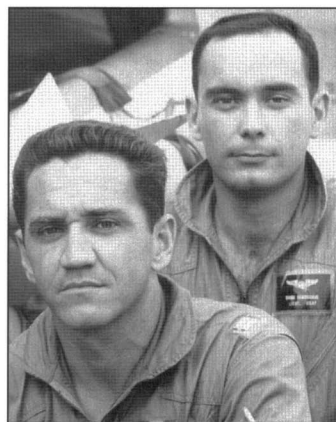
Larry Golberg, who was one of the first USAF F-4 instructor pilots, was later shot down by AAA and killed (along with 'GIB', 1Lt Patrick Wynne) during an armed reconnaissance mission on 8 August 1966.

The next MiG kill credited to the USAF was claimed by the 35th TFW on 12 May 1966 – the first for triple MiG-killing F-4C 64-0660. Maj Ray Dudley and 1Lt Imants Kringelis of the 390th TFS were 'Jupiter 03' in an EB-66 escort when they detected four MiG-17s only 20 miles south of the Chinese border. Dudley was flying as a one-ship element. 'Number One in the flight were Taylor and Cram, with Darby and Robuck as "Jupiter 02". My wingman, David Muma, aborted for technical reasons', he explained. An intense battle followed in which Dudley's crew engaged a MiG whose pilot was intent upon downing the 'prize' EB-66. Two



The 555th TFS's first six MiG-killing F-4 crews line up in early May 1966. The pairs are, from left to right, Capt Larry Keith (standing) and 1Lt Bob Bleakley (kneeling), Maj Paul Gilmore (standing) and 1Lt Bill Smith (kneeling), Capt Bill Dowell (standing) and 1Lt Hal Gossard (kneeling), Capt Max Cameron (standing) and 1Lt Bob Evans (kneeling), Capt Bob Blake (standing) and 1Lt 'Dub' George (kneeling), and Capt Larry Golberg (standing) and 1Lt Doug Hardgrave (kneeling) (via Doug Hardgrave)

Intrepid MiG slayers Capt Larry Golberg and 1Lt Doug Hardgrave pose with their F-4C a few days after their MiG-17 shoot-down (via Doug Hardgrave)





A rare Da Nang glimpse of triple MiG killer 64-0660 in the markings it wore when the jet claimed its first MiG kill, on 12 May 1966, with Maj Dudley and 1Lt Kringelis aboard (via Peter Schinkelshoek)

AIM-9Bs were launched and the second missile blew the MiG's tail section clean off.

Ray Dudley remembers, 'I think I got two MiGs that day, but I was never given credit for the second one'. The Chinese claimed that the confirmed MiG was one of theirs, and that the fight had taken place 25 miles north of the border in Yunnan Province. In fact VPAF MiGs used Chinese bases for sanctuary throughout the war, and there were several cases where US fighters pursued them across the border before abandoning the chase.

35th TFW pilots had to wait until 14 July for their next (and final) successes – a pair of MiG-21s. Participating in a MiGCAP flight for *Iron Hand* F-105s, two 480th TFS crews from Da Nang sighted a MiG-21 behind them and a second VPAF jet heading for one of the Thunderchiefs that was in the process of launching a Shrike anti-radiation missile.

Capt William J Swendner and 1Lt Duane Buttell jettisoned their wing tanks and headed straight for this second threat. Too close for an AIM-7 launch, they loosed off three AIM-9Bs, the first of which smoked past the MiG's canopy without exploding. The weapon did, however, alert the pilot to the F-4's presence, and he climbed away in afterburner. Swendner's third Sidewinder, now presented with a perfect target against a plain sky background, followed the afterburner flame and blew the MiG-21's rear fuselage apart.

Meanwhile, Swendner's wingman, 1Lt Ronald Martin (with 'GIB' 1Lt Richard Kriepps), who had dropped out of formation during the early stages of the turning fight, managed to move into the 'six o'clock' position on another MiG that was intent on shooting down the No 4 MiGCAP F-4C – the Vietnamese pilot had already fired an 'Atoll' missile at his target. 1Lt Martin followed the MiG as it soared away and hit it with a single AIM-9 shot, forcing the pilot to eject.

August passed without a Phantom II victory, but the MiGs were active again the following month when a solitary kill was claimed by an F-4 – although this time for the loss of a Phantom II. The action took place during the 16 September strike on the Dap Can bridge, when four MiG-17s jumped the 'Moonglow' CAP flight from the 555th TFS. 'Moonglow' leader fought back, firing four AIM-9Bs and two AIM-7Ds at the MiGs without success.

'Moonglow 04', crewed by 1Lts Jerry Jameson and Douglas Rose, was also pursued by an aggressive MiG pilot, but they managed to evade him and acquire a firing position behind a second jet. The latter promptly out-turned Jameson and ended up at his 'six o'clock', firing 23 mm cannon shells at him. As the fight had begun so unexpectedly, Jameson had had no chance to jettison his tanks and ordnance before entering the fight, but he accelerated out of the area in afterburner so as to give himself the chance to 'clean up' his F-4.



This bright red MiG-17 silhouette was applied to the forward fuselage of Bill Swendner and Duane Buttell's 480th TFS/35th TFW F-4C 63-7489 the day after their 14 July 1966 MiG-21 kill (T Hanson via George Pennick Collection)

Spotting another MiG ahead of him, he attempted a radar lock-on but overshot his adversary. Turning back into the fray, Jameson saw yet another MiG dead ahead and launched two AIM-9Bs at it. The missiles had barely cleared their underwing pylons when the Phantom II pilot had to take violent evasive action once again as a stream of cannon shells came hurtling towards him. Seconds later Jameson saw smoke, debris and a pilot hanging beneath a parachute.

The final pair of MiGs downed in 1966 were 'Gunfighter' kills made by the 480th TFS, which had been reassigned to the 366th TFW at Da Nang on 10 October 1966 following a period under 35th TFW control. The latter wing had effectively conducted a 'nameplate' change with the 366th TFW, which soon became established as the other principal 'MiG slayer' F-4C wing in South-East Asia. The 480th TFS would rack up 11 kills by October 1972, 5 November 1966 bringing it two more MiG-21 victories to add to its three previous 'Fishbed' successes

The 480th was performing an EB-66 escort mission at the time, the VPAF once again proving its determination to destroy one of these crucial barrier jamming aircraft. Fighter controllers waited until both the EB-66 and its escorting Phantom IIs were low on fuel before making their move. Fortunately, the subsequent fight was over within three minutes, as Klaus J Klause, who was 'GIB' in the No 2 F-4C, recalls;

"Towards the end of the mission there was one F-105 flight – callsign "Lincoln" – that hadn't checked in yet, and we later found out that they had never shown up. We had an "outrigger" formation of "Opal 03" and "04" above us at altitude (27,000 ft), and we ("Opal 02") were hanging about a mile from the EB-66's left wing, with "Opal 01" (Capt Jim "Friar" Tuck and 1Lt J J Rabeni) on its right wing. We were at about 25,000 ft, cruising at 0.72 Mach.

I had picked up a radar contact at 18 miles, and the EB-66 crew had picked up a coded indication of a MiG-21 radar, so they decided to turn back towards the north-west and leave. There was also a MiG call from an EC-121, but that was after we had engaged the enemy. The first MiG-21 came from our "deep six" in a 30-degree climb from low altitude, and this started the engagement. I called out, "There's a MiG down there" and Tuck called "I'm on him too". The lead MiG of the four that were out

there closed with the EB-66, and I saw it launch a missile as Tuck called to the '66 pilot to break to the right. My "nose-gunner" (pilot), 1Lt Joe Latham, jettisoned our three tanks, but Tuck didn't lose his.

I got the EB-66 on my radar as a big blip, followed by two smaller blips (a MiG-21 pursued by Tuck), and then at the end of this downward-spiralling daisy chain was another MiG-21 chasing "the Friar". I told Joe to lock on to this last MiG. We had the 'burners cooking, so we ate up the two miles distance from it. This silver MiG must have realised we were behind him, for he entered a left-hand turn and pulled up. We were apparently at a range of 3000 ft, so I said, "Hey shoot!" As the MiG pulled up against a clear blue sky, we hosed him with an AIM-9B. The missile came off the rail, jinked and exploded on him. The MiG looked as if it had just blown up and been punched over. We broke back left and almost ran over the pilot in his 'chute.

'Meanwhile, "Friar" Tuck had jumped on the lead MiG and fired two Sparrows (we had been briefed to "squeeze, release, squeeze and hold" the trigger to launch two AIM-7s), but they were just unguided rockets because he was inside minimum range. He was going pretty fast, and was soon almost flying close formation alongside the MiG. However, its pilot still wouldn't break off from the EB-66's "six o'clock", so Tuck practically shoulder-charged it to one side. Finally, the MiG broke away and dived, so Tuck fired another AIM-7. It appeared to explode just ahead of the MiG, making its engine flame out, or maybe the pilot just lost control of it and baled out.'

LESSONS LEARNED

The first 18 months of aerial conflict over North Vietnam had reinforced the findings of the *Feather Duster* report, yet the kill-to-loss ratio for F-4s against MiGs had been favourable. Of the 69 USAF Phantom IIs downed in 1965-66, only four were lost to MiGs, and of these only one was destroyed by an air-to-air missile. In return, the F-4 squadrons claimed nine MiG-17s and five MiG-21s, all but one with missiles.

The North Vietnamese defences had improved steadily during that time, with SAMs and ever-increasing AAA batteries driving the bombers to higher altitudes, where accurate bombing was harder. The limited number of targets allowed by Washington's political restrictions meant that the defences could be concentrated around these targets.

The modest number of aerial victories against the MiG force had done little to prevent aerial losses on the whole, since most of the American aircraft that had been downed had fallen to SAMs or AAA, and not MiG-17s or MiG-21s. However, these MiG kills had an essential morale-boosting effect in a war which seemed increasingly implausible to those who were fighting it.

One of the principal concerns for American fighter crews was the uncertain performance of their missiles – the only armament on F-4Cs until May 1967. By then there had been numerous combats where missiles had failed, either through technical problems or misuse, and a gun might have secured a kill.

The overall statistics for the AIM-7 Sparrow between 1964 and 1972 make for grim reading, as they show that an average of eight missiles had been fired for each kill (by the 1991 Gulf War, big improvements in both



This F-4C displays its four AIM-7s and a pair of triple ejection rack (TER) mounted camera pods. This 'photo chase' configuration was used early in the war to film strike missions by other Phantom IIs, the jet's back-seater being a qualified combat documentation photographer. 64-0742 was carrying a more lethal cargo when it was fatally damaged by AAA while attacking a truck on a 27 February 1966 'Wolfpack' mission over Laos (National Archives/KVT)

the missile and its launch vehicles had reduced that figure to 1.7 per kill). F-4Cs on CAP missions usually carried four AIM-7Ds, and in several cases fired all of them at a target without registering a hit. In fact, the AIM-7D – principal armament for the F-4C between April 1965 and April 1966 – scored only one confirmed kill in that period! The weapon was subsequently replaced by the AIM-7E, but this too had achieved only one confirmed victory by the end of 1966.

The AIM-7 was designed as a mid/long range radar-guided weapon for the US Navy's fleet defence F-4B Phantom II, being intended for use against large, relatively slow targets flying predictable courses at medium or high altitudes. It had to be launched within exact parameters, and ideally head-on at the target, beyond visual range. It was never intended for use against manoeuvring targets at close range.

The exigencies of Vietnam combat seldom allowed textbook launches using the standard, full radar lock-on mode. It took five seconds for the missile to acquire its relevant data from the F-4s radar/fire control system and launch. A 'dogfight' mode using boresight (narrow radar beam) lock-on was available for close-in fighting, allowing a one-second launch procedure, but this proved very unreliable, with only one hit being achieved in the first 65 boresight launches.

In 'full systems' mode, the AIM-7 required the F-4C's AN/APQ-100 radar to be locked onto its target during the missile's entire flight time. This made the F-4 itself vulnerable to attack, and should its crew have to manoeuvre to avoid an attacking MiG, and thereby break the radar lock, the missile would run wild. It was also possible to lose the radar lock at altitudes below 8000 ft due to confusing radar returns from the ground. Proving the latter point, the 366th TFW fired 21 AIM-7s below 8000 ft without scoring a single hit.

To make matters even worse, many of the complex components within both the F-4C's radar and the missile itself were not very resistant to either the rigours of combat or robust handling, even with adequate maintenance. Former 'GIB' Steve Wayne remembers;

‘Although the F-4C’s radar was the best we had in Vietnam, it was lacking greatly, particularly in the ground mapping mode, where it was worthless. We really had to do the old “time and distance” navigation to go from hill to hill at low level.’

Radar failure – by no means unusual in the monsoon climate of the area – rendered the AIM-7 useless, but it also suffered from fusing problems, motor ignition failure, premature detonation or failure to ‘self-tune’ before launch. The missile’s launch parameters were displayed in symbology on the cockpit radar screens, but these were only correct for a target in straight and level flight. Against a (more typical) manoeuvring target, the launch parameters changed and varied greatly, but the screen symbols could not give the pilot those figures with sufficient accuracy.

Often, pilots’ lack of faith in the missile prompted them to ‘ripple fire’ up to four at a target, each one leaving a very visible white smoke trail for an enemy pilot to see and avoid. By then, however, he might well have already noticed the prominent black smoke trail left by the F-4’s J79 engines when not in afterburner.

The USAF *Combat Snap* Report recorded that during *Rolling Thunder*, F-4C/Ds made 260 AIM-7 launch attempts, of which only 21 resulted in confirmed kills. For a time the ‘rules of engagement’ reduced this figure further, as Steve Wayne explained;

‘Due to the need to make visual identification of the target, combined with the wing’s minimum airspeed (400 knots in combat) rule against MiG-17s, we were always launching AIM-7s out of parameters – too close with too much overtake.’

Given the difficulties of employing the AIM-7 successfully, F-4 pilots in 1965-66 tended to favour the aircraft’s ‘secondary’ armament, the AIM-9B Sidewinder. This much simpler, short-range weapon was also designed to hit targets flying straight and level. A MiG manoeuvring at 5g exceeded the missile’s turning capability, and even a 3g turn by a target reduced this envelope by 50 per cent. Its early infrared detection system was relatively incapable of distinguishing the target aircraft from its exhaust wake, the sun, bright clouds or the terrain below. MiGs could escape into cloud, where their infrared signature was reduced and the missile often broke lock. If pilots launched the missile with their aircraft flying in more than a 2g turn it would probably fail to guide.

Crews also had to remember that the missile’s growling headset signal, indicating that it had picked up a heat source ahead, would only give a chance of a kill if the missile was launched within its correct firing envelope. In action, more than a quarter appear to have been fired outside those design parameters. Finally, the AIM-9B’s flat-fronted seeker head caused drag and reduced its range.

Despite such shortcomings, the missile did much better than the

MiG killers 1Lt Doug Hardgrave (left) and Capt Larry Golberg check out the AIM-9B Sidewinders on their camouflaged, but uncoded, F-4C in early 1966 (via Doug Hardgrave)



AIM-7 in these early combats, scoring 11 kills. By September 1968 this figure had risen to 26 out of 175 attempted launches since April 1965. However, this still only amounted to a 'p.k.' (probability of a kill) of only 0.15 – far below the '65 per cent success rate' (or 71 per cent for the AIM-7) indicated by pre-war tests, held in ideal conditions at high altitude against non-maneuvring targets.

An important problem for those pilots who were drawn into fights with MiGs (and it must be emphasised that quite a number never saw a MiG over the North) was the lack of air-to-air combat training for USAF fighter crews at the time.

Tactical Air Command's continued emphasis on the nuclear strike mission in the early 1960s meant that the majority of training was devoted to low altitude attack, leaving less than a tenth of all flying time to be spent on air-to-air combat training. The advent of all-missile armament seemed to spell the end of dogfighting, and a number of pilots from replacement training units went to war in F-4s and F-105s with no air-to-air experience at all.

In some quarters air combat manoeuvring (ACM) training was seen as a threat to flight safety statistics and a cause of delays in getting urgently needed pilots to the war zone as replacements for those who had completed their 100-mission tours.

Steve Wayne recalled that, 'A lack of sufficient training in air-to-air combat and some outmoded World War 2 tactics such as the "fighting wing" formation certainly hampered the capabilities of the F-4, which was really an extremely versatile multi-role fighter'.

For USAF pilots, the requisite training was not properly introduced until *Red Flag* began post-Vietnam. However, they were helped by the equivalent lack of air combat skills on the part of most VPAF pilots until mid-1967, when a new, aggressive confidence was noted in the MiG-21 fighter regiments. In most engagements, MiG pilots had the advantage only when they could initiate the opening attack under precise GCI direction, and then escape when American aircraft responded.

While the quality and experience of VPAF pilots steadily improved, the USAF squadrons were gradually losing most of their combat-seasoned pilots (several with World War 2 or Korean War combat behind them), and replacing them with hastily trained 'new guys'. The result was a decline in the USAF kill ratio from 3-to-1 in their favour in April 1965 to an adverse ratio of 0.85-to-1 in favour of the VPAF from June 1967 through to March 1968.

In MiG killer Ralph Wetterhahn's estimation, the F-4C was not the ideal fighter for the job, hence the poor kill ratio;

'With no gun and two types of missiles whose reliability was about ten per cent, you'd have to rate the F-4C's abilities as a fighter as low. We were having a tussle fighting 1950s-era MiGs. The only real advantage we had was to accelerate out of the fight. I'd trade that for turn performance any day. Turning with a MiG-17 was suicidal. You could do pretty well turning with a MiG-21, but he was so small it was tough keeping him in sight. We were twice the size of the MiGs and had that big smoke trail. Still, I'd take that F-4 ride into Hanoi over the F-105 any day!'

Despite these shortcomings, the first half of 1967 brought a period of success for the USAF F-4s that decimated the VPAF's MiG-21 force.

BOLO AND BEYOND

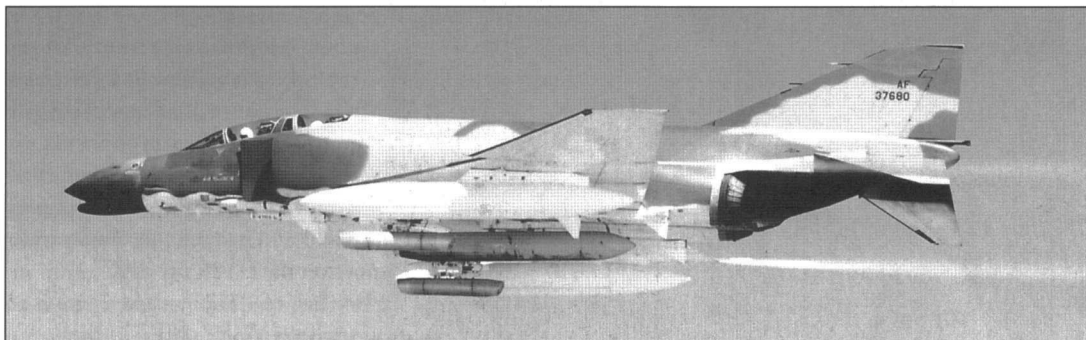
Although MiG activity in 1966 still cost relatively few US fighters, and losses to SAMs or radar-guided AAA declined after the introduction of QRC-160 (AN/ALQ-71) ECM pods in October 1966, the VPAF increasingly harassed American strike formations. 'Atoll'-armed MiG-21s were particularly aggressive, and their main tactic was to force the bomber flights to jettison their ordnance and defend themselves. In December 1966, one-fifth of all strike aircraft sent against targets in Route Package VI (RP VI) had to shed their ordnance when warned of imminent MiGs. Sections of bomb-carrying F-4Cs were often inserted between F-105 flights so that they could quickly clean up their aircraft and move out to defend the 'Thuds'.

The VPAF's 921st FR had started operating MiG-21F-13s alongside its MiG-17s in January 1966, entering combat with F-4s for the first time on 23 April and firing 14 'Atolls' in engagements during April and May without success. Pilots found that operating their small tracking radar and optical gunsight while flying the nimble fighter was extremely challenging, and the regiment did not make its first claim (F-105D 61-0168 of the 333rd TFS/355th TFW, which the USAF stated was lost to AAA) until 7 June. The 921st's first confirmed kill – and the first US aircraft lost to an AAM during the war – occurred on 5 October when F-4C 64-0702 of the 433rd TFS/8th TFW was hit during an EB-66 escort mission.

Up to December 1966, pilots of the short-ranged MiG-21 concentrated on defending the airspace close to their own airfields. That month their Soviet instructors advocated placing them in the established paths of strike formations to increase the interception rate. Their revised tactics involved slashing, supersonic attacks on the bombers, firing 'Atolls' from around 1500-2000 m and then heading home at low altitude.

Plans to remove this obstacle to *Rolling Thunder* precluded attacks on airfields like Phuc Yen (Noi Bai), where the small force of around 16 MiG-21s could have been eliminated. The alternative was to try and draw

Col Olds' Operation Bolo MiG killer (F-4C-21-MC 63-7680) carries an SUU-16/A gun pod and two AAVS Type 4 combat camera pods. After a second MiG victory on 13 May 1967, it was shot down by AAA on 20 November 1967 while on a SAM-site hunt (USAF via Chris Hobson)





Home of the 'Wolfpack' – Ubon RTAB in Thailand
(USAF via Col Ron Thurlow)

Col Olds gives F-4C-19-MC 63-7594 a thorough pre-flight inspection. The 433rd TFS 'Satan's Angels' design featured a green and black devil's head with yellow stars and winged halo within a black circle. Robin Olds began flying missions with the 433rd after it transferred from George AFB in December 1965. Soon after taking command of the 8th TFW, he told his pilots, 'I'm the new guy. You know a lot that I don't know and I'm here to learn from you. But in two or three weeks I'm going to be better than all of you, and when I know more about your job than you do, you're in trouble!' (USAF via Col Ron Thurlow)



the MiGs into battle, and since 1965 the Joint Chiefs of Staff had proposed various deception tactics to lure them into an F-4 ambush and destroy them in significant numbers. The eventual outcome, Operation *Bolo* (named after a Filipino hunting knife or Aboriginal 'bolas' hunting weapon), was calculated to have 'accounted for the destruction of 44 per cent of North Vietnam's first-line fighter force (MiG-21s)' and, as the USAF's Project CHECO Report went on to point out, '21 per cent of all USAF aerial kills in the North Vietnam conflict (up to that time). By the end of 1967 the overall US kill rate was 5-to-1'.

When Col Robin Olds took over command of the 8th TFW on 30 September 1966 at Ubon RTAB, his philosophy of fighter combat, rooted in his World War 2 experiences as a 479th FG P-38 and P-51 pilot, did not accord exactly with accepted views on fighter pilot training. However, for his pilots Col Olds' influence on this stage of the air war cannot be over-estimated. Lt Col George McKinney's comments were typical of many expressed to this author by those who flew with Robin Olds;

'Quite simply, he was a leader of men to an extent that few in the history of our great nation have become, and the finest USAF fighter pilots of the day worked their way to Ubon to follow this icon into combat.'

In the 1960s, when the USAF concentrated on the tactical nuclear strike mission, Olds advocated intensive training in conventional air-to-air and air-to-ground tactics – precisely what was flown in the Vietnam conflict.

His predecessor at Ubon, Col Joe Wilson, had concentrated on predictable strike missions to keep the F-4 sortie rate as high as possible within a test programme known as *Rapid Roger*. This included night missions that placed further strains on the resources of both aircrews and maintenance personnel. When Seventh Air Force Commander Gen William 'Spike' Momyer (also a World War 2 ace) brought in Robin Olds to replace Col Wilson, the jaded 8th TFW experienced a total change in leadership style.

The KC-135A tanker fleet made Phantom II missions possible in Vietnam, with in-flight refuelling taking place several times on most missions over the North. Daring rescues of fuel-starved F-4s by tanker crews who ventured closer than they should have to hostile territory were also a regular occurrence. F-4C 63-7544 was lost on 8 December 1966 with the 480th TFS/366th TFW when small-arms fire damaged it during a night take-off from Da Nang (USAF via Robert F Dorr)

Whereas Joe Wilson had flown only 12 missions during his year of tenure, Col Olds was to fly 152. His philosophy, learned in part from his most respected commander during World War 2, Col 'Hub' Zemke, was to lead from the front and involve himself at every level of the wing's activities with energy and enthusiasm. By January 1967 Olds had persuaded Momyer to abolish *Rapid Roger*. A mock funeral was held at Ubon, where 'Roger' was buried in a black casket and the crews ceremoniously urinated on the grave.

One of the most obvious reasons for this turn-around was *Bolo*, initially conceived by the wing's tactics officer, Capt John B Stone. His plan was initially proposed to Gen Hunter Harris Jr, PACAF (Pacific Air Force) Commander, who rejected it. Gen Momyer was also unmoved by Olds' assertion that the MiGs needed urgent attention, but he did invite the colonel to discuss his plan in Saigon during December 1966, where Momyer's director of operations, Gen Donovan Smith, was enlisted as an ardent supporter.

Olds and an experienced 8th TFW team including Maj James Covington, Capt John B Stone and 1Lts Joe Hicks and Ralph Wetterhahn worked on the idea from 13 to 22 December, using a tiny storage room at Ubon as their HQ. They then briefed Gen Momyer, who accepted the plan outright. Ralph Wetterhahn explained its genesis;

'Col Olds and J B Stone conceived the idea of the mission. Hicks and I worked with J B Stone and J D Covington (the Intelligence Officer) to plot out the details of the whole mission. Covington got the data on how often the MiGs flew, how many generally took off and how long they stayed airborne. We worked together, deciding how long a flight could orbit over each target area (airfields and blocking positions near China), the fuel requirement and the total length of the mission. We had flights orbiting over all the MiG bases, with relief every five minutes or so except at Gia Lam, since it was overlapped by the Phuc Yen flights. We wanted to deny landings to the MiGs, so we needed 45-50 minutes minimum coverage after they scrambled.

'Hicks and I put coloured tape over the map for the routes in and out. The beauty of Olds' way of doing things was that he refused to tell us



where we would fly on that mission. We all wanted to be Flight Leaders, but not knowing where we might fly made us plan each "line" very, very carefully. J B Stone said, "You might be riding that train".

'I remember when we attached the first outbound strip on the most dangerous route, J B turned to us with that savvy smile of his and said, "We got the first guys out!" That first route was for the mission Maj Crow would ultimately fly. We chose the black tape and it went down from the south-west (not down "Thud Ridge") to right over Gia Lam, downtown Hanoi. We talked about how that flight was almost sure to have losses, but we needed the coverage. Olds would pop in most evenings to see how things were going. J B or Covington would bring him up to speed.'

The intention was to cut the MiGs off from landing at their airfields or from escape to China, destroying them in the air or causing them to run out of fuel. A major strike force was to include 28 F-105s from the 355th and 388th TFWs, plus 56 F-4Cs from the 8th and 366th TFWs, many of which would 'pretend' to be F-105s.

The Phantom IIs were to carry AN/ALQ-71 jamming pods as fitted to F-105s on their right wing pylons, and fly the same carefully spaced 'pod jamming' formations as the 'Thuds', to give effective protection against SAM radars. Pilots were told to request Doppler navigation checks en route like F-105 pilots, although the F-4 had a different inertial navigation system. They were also told to issue 'Green 'em up' (arm your bombs) instructions near the target using F-105-style call signs to complete the illusion. The 'Wolfpack' flights were allocated call signs based on automobile brands, and Col Olds felt that his 'Oldsmobile' flight signature compromised security, so his pilots used first names instead.

Completing a force of around 100 aircraft were EB-66 jammers, two CAP flights of F-104Cs and the usual KC-135 tankers and RC-121 support aircraft. To the North Vietnamese it would have resembled any other F-105 strike. The F-4C flights were staggered with five-minute gaps between take-offs to maximise their MiG-engagement time over the target, and they were divided into a 'west force' of seven 8th TFW flights and an 'east force' of five flights from the 366th TFW. Crucially, the skies over the North would briefly contain no other US aircraft at the start of the operation so that, for once, the first three Phantom II flights would have a 'missile free' firing situation without the need for the usual visual identification of their aerial targets.

Although the weather forecast for the morning of 2 January 1967 had been good, conditions rapidly deteriorated, with heavy cloud over the Hanoi area. This was a real problem, partly because the strike force would have little warning of SAMs coming up at them through the cloud base, but more because it might keep the MiGs on the ground. However, the mission went ahead partly because the ALQ-71

Col Robin Olds with his 433rd TFS 'troops'. As Brig Gen Olds recently explained to the author, 'The relationship between the pilot and the groundcrews is something not understood or thought of by the people up above. Any MiG kill credit went to the crew chief and his aircraft, not to the pilot's own assigned aircraft. Because of the arduous maintenance schedules, it wasn't always possible for a pilot to fly his own aircraft. As a matter of fact, flying your own bird was a rare occasion. Yet the system worked. Assignment of aircraft to pilots boosted morale, but it also enhanced individual and unit pride' (via Michael J France)



Posing outside the 'Wolfpack's' lair are (from left to right) Col David 'Chappie' James Jr (Wing Deputy Commander for Operations), Col Robin Olds (Wing Commander) and Col Vermont Garrison (Wing Vice Commander). All three had served in the Directorate of Operations in Washington DC. At this stage, just after Operation *Bolo*, the 8th TFW's MiG score stood at 15, recorded in plywood stars on the 'portals'. 'Chappie' James later became a four-star general in charge of Norad (USAF via Col Ron Thurlow)



Pods were only on loan to the F-4 wings for a week. They were a real innovation for the Phantom II crews, as Ralph Wetterhahn clearly remembers;

'A very, very short briefing was given on how to turn the pod on and what distances to keep when it was working, or where to move if it had a "fail" light. We were told that if the "fail" light came on, the system might still be putting out some jamming, so we were to recycle it, but not turn it off. We had no in-flight training on "pod formation". In fact, *Bolo* was the first time we used the pods.'

'In my case the pod failed inbound to the target, so I moved to within 500 ft of Col Olds' F-4. During the dogfight we got a whole bunch more than 500 ft separation, and sure enough on the way out a SAM was launched at my "six o'clock". Mine was the only aeroplane with no jammer at the time. Luckily, the missile had a bad booster separation and tumbled back into the clouds.'

Air combat training for the pilots who had previously received little preparation for this was also necessarily brief. According to Ralph Wetterhahn it was mainly limited to the classroom;

'Most of it was devoted to using the AIM-7 and AIM-9 in aerial combat, and it was taught by guys like Everett Raspberry, who had fired lots of AIM-9s, and "Dee" Simmonds, who briefed on missiles. Neither was brought in on the plan. They just did briefings. I don't remember any ACM discussions. Of course, we routinely did ACM against the F-86s (Royal Australian Air Force Sabre Mk 32s of No 79 Sqn) that were stationed at Ubon. Those Australians were fantastic pilots, but never got a chance to duke it out with the MiG-17.'

CLOSING THE TRAP

After some last-minute difficulties in adapting the ALQ-71 pods to fit the F-4Cs' pylon sway-braces, the Phantom II flights began to launch, led by 'Olds' flight at 1225 hrs and followed by 'Ford' and 'Rambler' flights. Several pilots had to correct a tendency to roll to the left on lift-off, caused by the unfamiliar asymmetric load of a 370-gallon fuel tank on the left outer pylon and an ALQ-71 on the right wing.

As luck would have it, these three flights were to score all seven of the

MiG-21s claimed that day. None of the other US fighters encountered MiG activity, and the weather near the target deteriorated so much that the 366th TFW's 'east force' was unable to reach its patrol areas. One of the 8th TFW flights also had to abort because of fuel transfer and ALQ-71 problems, leaving some 32 F-4Cs, 20 F-105s and four F-104Cs to fly the whole mission. One of the two disappointed 8th TFW crews included Capt Dick Pascoe;

'I was flying number two on my squadron commander for *Bolo*. He could not get his refuelling receptacle

door open, and therefore could not take on necessary fuel. Because we were directed to abort in pairs, it was my sad fate to be in one of only two jets from the wing to air-abort.'

However, the reduced numbers were not the main problem that day. Ralph Wetterhahn explains;

'Weather was the issue, so having more aircraft over Hanoi would have made little difference. We learned later that the MiGs that were airborne were told to stay in the clouds or beneath the weather after we started shooting them up. Had the weather been ideal, more MiGs would have gone down and some of ours too, no doubt.'

As Col Olds' flight neared the Red River, he increased speed from 480 to 510 knots just as F-105s would have done, and he over-flew Phuc Yen at 1400 hrs. The MiGs were still grounded at Noi Bai and Kep (the 366th TFW's assigned area) by ten-tenths cloud extending from 1500 m down to 300m. MiG-17s apparently took off as the force approached within 40 kilometres of Noi Bai, but had to remain below cloud since they had no radars. It may have been one of these that 'Olds 03' picked up on radar.

Passing over the airfield, the F-4s turned towards Hanoi on an F-105 ingress route, then back towards Noi Bai. The carefully timed operation brought Col 'Chappie' James' 'Ford' flight into the target area at this point, and Col Olds had to cancel the 'missile free' option to avoid possible attacks on friendly aircraft. As he did so, the MiG-21s began to launch from Noi Bai and pop up through the cloud base.

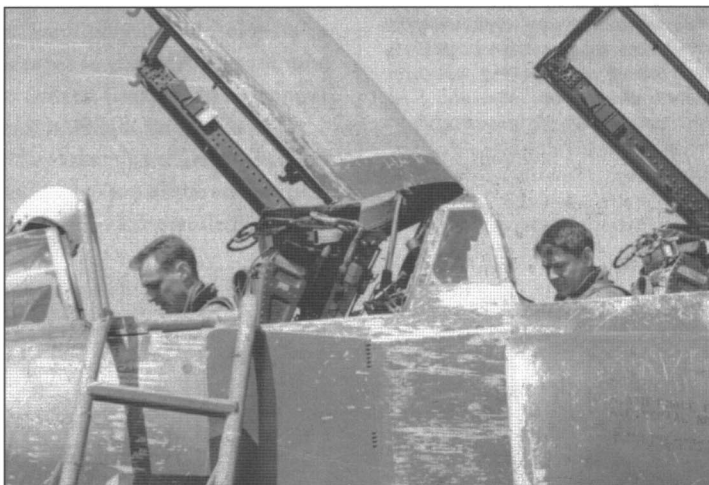
'Ford' flight detected two of them climbing behind Olds. The latter pilot's wingman, Ralph Wetterhahn (with 'GIB' Lt Terry Sharp), also saw them. 'MiG-21s – silver with a distinctive black nose cone', was how he described them. Then two more rose in front of Olds and the fight was on.

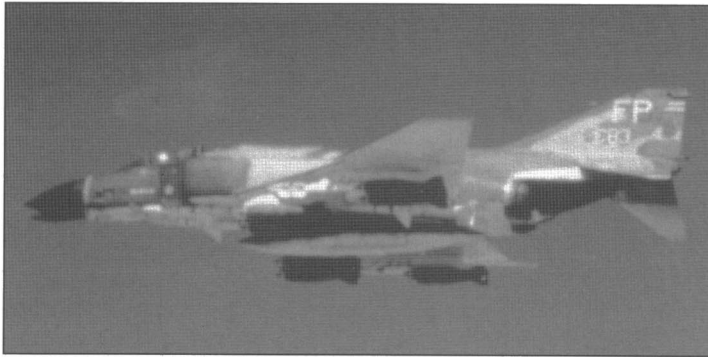
Olds and Wetterhahn turned left to clear the flight from behind, at which point they picked up another MiG, also banking left, at a range of just 1.5 miles. Col Olds, on his first trip to the Hanoi area, launched two AIM-7Es, but his aircraft soon began to overtake the MiG and his radar broke lock. He followed up with two AIM-9Bs, but the MiG then dived into clouds and the Sidewinders almost certainly failed to follow it. Meanwhile, Col Olds' F-4C (63-7680) had a MiG-21 closing on its 'six o'clock', so 1Lt Wetterhahn fell back and took up a firing position on its rear quarter. He launched two AIM-7Es and the



Ralph Wetterhahn poses with F-4C-21-MC 63-7680, which was used by Col Olds and 1Lt Charles Clifton for Olds' first MiG kill. The ubiquitous 497th TFS Singhai lion (a Bangkok brewery trademark) to the right of Wetterhahn's head and the Navy-style LAU-17/A inboard pylons with AIM-9Bs are noteworthy. This pylon/rack assembly needed an adaptor to carry a TER

1Lts Ralph Wetterhahn and Jerry Sharp (right) in F-4C-19-MC 63-7589 – their *Bolo* MiG killer. The fighter is rapidly reverting to its original grey as the poorly-primed camouflage wears off. It has the early Martin-Baker Mk 5 seats, later replaced by the Mk 7. Although both seats saved many lives, they were unpopular with USAF crews who felt that they could cause back injuries (Both photos via Ralph Wetterhahn)





Capt W S Radeker and 1Lt J E Murray flew this F-4C (63-7683) for their MiG-killing encounter during Operation Bolo, although it wore FY codes at that time. Overpainting on the rudder probably obliterated the 433rd TFS 'spook', replaced by a red lion. With a full load of M117s, the jet's air-to-air armament on this mission is just four Sparrows (via Col Jack D Morris)

MiG killer F-4C-21-MC 63-7710 returns with empty bomb racks, but with its AIM-7s still in place. Since MiG encounters were comparatively rare, these missiles often stayed in their launch wells for long periods, contributing to poor reliability. On 12 June 1967 this Phantom II developed hydraulic problems soon after take-off from Ubon on a 'Triple Nickel' mission and its crew had to eject (via Col Jack D Morris)



second guided successfully, striking the VPAF fighter just ahead of the tail, causing it to explode. Although the North Vietnamese claimed that all its pilots ejected safely that day, no parachute was seen to emerge from the first MiG as its remains descended in a flat spin.

Col Olds then observed another MiG-21 (11 sortied in total) within his minimum range and rolled his F-4 to extend the distance, dropping

in behind the MiG at 4000 ft. Two AIM-9Bs left his Phantom II's wing in ideal down-sun launch conditions and the first blew a wing off the slender MiG-21, turning it into a smoking fireball.

The other element of 'Olds' flight, which had separated earlier, then followed their CO's element in a left turn. Capt Walt Radeker and 1Lt James Murray, in 'Olds 04', saw a MiG pass beneath them in hot pursuit of 'Olds 03'. Capt Radeker flew a 'yo-yo' manoeuvre to achieve adequate separation for a missile launch, although this proved too effective, for his AIM-9B initially gave only a weak acquisition tone. Closing the gap a little, he heard a more aggressive buzz from the Sidewinder and launched it in a slight climbing trajectory. The missile slammed into the MiG's rear fuselage and the fighter fell away, trailing black smoke.

'Ford' flight then met the enemy for the first time, entering a violent engagement with seven MiG-21s. The Phantom II crews were initially threatened by three 'Fishbeds' – two at 'ten o'clock high' and a third climbing behind the flight, moving into a firing position on 'Ford 03' and '04'. Warned by Col James' 'GIB', 1Lt Bob Evans, the F-4 pilots turned right and the MiG inexplicably broke to the left, now trailed by 'Ford 01' and '02'. 'Chappie' James fired an AIM-9B but the MiG pilot out-turned it, leaving 'Ford 02', flown by Capt Everett Raspberry and 1Lt Robert Weston, to keep up the chase.

Col James was then threatened once again by the two MiGs that had appeared at their 'ten o'clock' position, and he fired two more Sidewinders, again without registering a hit. 'Razz' Raspberry had a better firing position on his solo MiG, having rolled in some 3500 ft behind it. His missile guided precisely and the MiG tumbled away in a powerless stall, Col James having seen a fire appear aft of its canopy.

'Olds' and 'Ford' flights, at the end of their combat fuel, left the area. Radeker's F-4C had already reached 'bingo' fuel by then as his 600-gallon centreline tank had not fed properly.

Entering the arena over Noi Bai next was 'Rambler' flight, led by Capt John B Stone, with his 'GIB' Lt Clifton Dunnegan. Their wingman, 1Lt Lawrence J Glynn, spotted four MiGs at six miles off their right wing, but radio failure prevented him from reporting this to J B Stone. 'Rambler 04', crewed by Maj Phil Combies and his 'GIB' 1Lt Lee Dutton, then

picked up the MiGs and noticed two others following three miles behind them. Seconds later Capt Stone detected the bandits turning in front of him, conceivably following 'Olds' and 'Ford' flights as they egressed.

Closing on them from 4000 ft above and a range of two miles, Stone followed the leading MiGs as they broke left. Combies and Dutton (in F-4C 64-0838) slid high to the outside of the flight as it turned and engaged maximum afterburner to hold position. Combies then secured a full-systems lock-on in 'boresight' mode on a MiG, the pilot duly recording the following details of the combat at the time;

'I selected radar and interlocks out, as pre-briefed for an ACT (Air Combat Tactics) environment. I had no difficulty in tracking the MiG. I don't think I pulled over 4g during the whole battle. Using the Navy tactic of disregarding the steering dot, I pulled lead on the MiG using the (gunsight) reticle. When I felt I was where I wanted to be I pulled the trigger, released, pulled again and held.'

In so doing he launched two AIM-7Es at a range of one mile and at an altitude of 12,000 ft. The first missile apparently failed to launch but the second guided well. 'It impacted in the tailpipe area, followed by a large, orange ball of fire and a 'chute sighting', he recalled. It was the first of two kills for Phil Combies.

J B Stone's element continued to pursue the first two MiGs, but they were in turn followed by the two trailing 'Fishbeds' (numbers five and six). Stone broke sharply to the right to evade their attacks and then resumed his pursuit of the lead MiG-21. His wingmen, 1Lt Lawrence Glynn and 'GIB' 1Lt L E Cary, performed a left-hand barrel roll, became disoriented and rejoined with Maj Combies' F-4 in error. Stone pressed on, moving into a favourable launch position.

Calling for 'boresight', he was unsure whether they had a lock-on due to the 'excessive chatter on the RT' (a general problem that day) and tracked his target with the sight pipper. He fired a single AIM-7E but didn't see it leave his jet. Two more were ripple-fired and the second exploded at the wing root of a MiG-21. It blew apart and the pilot ejected.

As the fight developed further, J B Stone (already exhausted by illness and lack of sleep from the previous night) saw two more MiG-21s in a left turn three miles ahead, and he turned towards them, intending to fire an AIM-9B. Seconds later, 'Rambler 03' warned him of another MiG closing for a gun attack at 700 ft, and he was forced to break into the adversary. He lost the MiG, but his wingman Glynn, still on Combies' wing in error, found another.

The pair being followed by Glynn and Combies separated and a single F-4C went after each of them. Glynn and Cary launched two AIM-7Es at



A 433rd TFS crew dismount from their F-4C at Ubon around the time of Operation Bolo. The tail of double MiG-killer 63-7680/FP is visible further down the flightline (via Robert F Dorr)

Maj Phil Combies is seen at the time of his DFC presentation ceremony at Ubon (via Ralph Wetterhahn)



their target, and once again it was the second one that destroyed their MiG. Their Phantom II sustained some gashes and dents on its belly as it flew through the debris. Combies also launched a pair of Sparrows at his MiG, but neither scored a hit. Two AIM-9Bs followed, detonating near the 'Fishbed' but causing no serious damage. As he fired his last pair of Sidewinders, Maj Combies received a non-specific MiG-warning and made a precautionary hard right turn, losing sight of his missile as he did so.

With seven MiG-21s downed during the operation (the VPAF only admitted the loss of five), two more a little over a month earlier and another two on 6 January, the USAF had almost halved the operational 'Fishbed' inventory. Although better weather and increased missile reliability might well have boosted the kill total still further, in most respects the F-4Cs had everything their own way.

No Phantom IIs were lost or seriously damaged and all the engagements had taken place at 10,000-15,000 ft in clear skies, where the missiles launched by ten F-4s had performed best, many of them in full systems mode. Col Olds had taught his men to keep their speed up and avoid close dogfights. Three of the AIM-9Bs launched within parameters had hit MiGs and four out of twenty AIM-7Es were similarly successful.

Conversely, VPAF tactics were poor. Late take-offs and an uncharacteristic lack of decisiveness by Central Command when caught by surprise meant that the MiG pilots were hit before they could gain advantageous positions to deal with the F-4Cs. However, few pilots were lost, and the MiGs could be quickly replaced by newly-delivered aircraft that were still crated up at Noi Bai. The VPAF's main response was a change in tactics, as well as more intensive training. From then on, small groups of two or four MiG-21s were to be used in quick, slashing attacks from above, while MiG-17s would make similar stabbing attacks from each side of a strike formation, engaging in closer dogfighting if necessary.

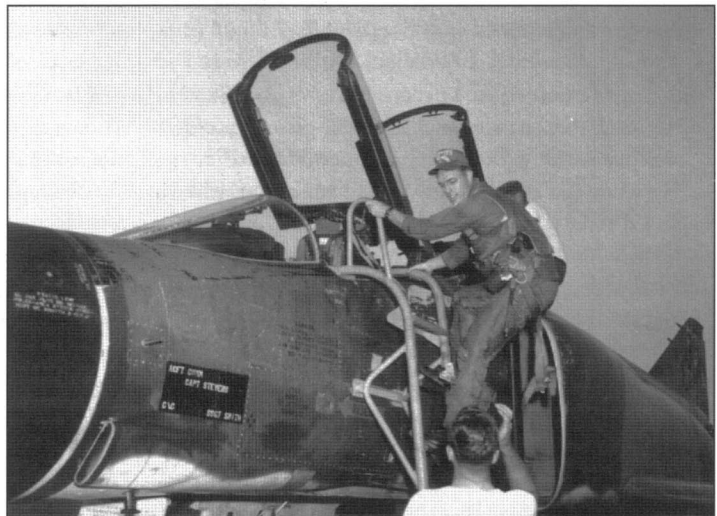
Operation *Bolo* had certainly paid off in both practical and psychological terms. After Col Olds had led the F-4s back to Ubon, he taxied in towards the 8th TFW ramp with his hands clasped above his head. Later, typically, he threw a huge party for the maintenance crews. His reputation was, in any case, firmly established with his men, and so was that of the F-4C, which had proven superior to the MiG-21 in the right conditions.

The next stage in the neutralising of the MiG force should have been a series of attacks on their bases, but political constraints left them untouched, allowing the VPAF to quickly regenerate their squadrons. As Ralph Wetterhahn commented, 'The rules were insane, but we were willing to live by them'.

A further deception flight was made on 5 January, as recounted by Dick Pascoe;

'It had been observed that when weather reconnaissance RF-4s made the sweep over the RP VI target area

The 100th mission usually marked the end of a combat tour, although many F-4 pilots and WSOs returned for a second or third tour. Ralph Wetterhahn flew his 100th sortie in MiG killer F-4C-23-MC 64-0739/FG, still in early 433rd TFS markings with the 'spook and eight ball' rudder cartoon, worn black anti-dazzle strip (a relic of the 'Navy grey' paint scheme) and no IR sensor housing under the nose. This Phantom II was flown by Maj (later Lt Gen) Bill Kirk and 1Lt Steve Wayne for their 13 May 1967 MiG-17 kill (Ralph Wetterhahn)





Ralph Wetterhahn with F-4C-20-MC 63-7641, which had the 433rd TFS 'spook and eight ball' design on its radome (replaced by the *Satan's Angels* artwork from early 1967). However, the flaking black paint on the undersides of this 'dorkless' (no AAA-4 infra-red seeker housing beneath the radome) Phantom II suggests an earlier assignment to Ubon's 497th TFS 'Night Owls'. The seeker housing was a hangover from the F-4's Navy ancestry, the USAF not adopting the AAA-4 intercept device for its Phantom IIs. From production Block 24, F-4Cs came off the line with 'plain' radomes (as used on early F-4Ds also), and earlier aircraft were supposed to be retro-fitted with them. However, supply line delays meant that many F-4Cs entered combat with 'F-4B' style radomes, and retained them thereafter. On some aircraft the housing was occupied by a combat camera (Ralph Wetterhahn)

radar, any aircraft. The weather beyond the Red River and over Hanoi was solid overcast.

'Subsequent to our return, it was determined through intelligence sources that the ruse was not detected by the North Vietnamese. Therefore, it was decided to fly the missions again on 6 January. Because I had the experience from the day before, I was again selected to lead the two-ship, this time with a different wingman. We had "missiles free" again, but the mission was flown with some significant variation from that of the previous day with the result that both my wingman and I downed two of the four MiG-21s we engaged.'

Capt Pascoe and 'GIB' 1Lt Wells, with Maj Tom Hirsch and 'GIB' 1Lt Roger Strasswimmer as 'Crab 02', encountered accurate radar-controlled AAA near Noi Bai, defeating it with their ALQ-71 pods. Flying close together, they would have appeared as a single blip on NVA radars. 'Crab' leader acquired the four MiGs on radar without EC-121 support and closed for an AIM-7 launch. Dick Pascoe had made a VID by the time the first AIM-7D took off, but it was his second missile that blew a hole in the leading MiG's centre fuselage and sent it tumbling in flames.

Hirsch had also fired at this MiG without success, but then found the third and fourth MiGs turning in behind him. 'Crab 01' initially went after the second MiG, which escaped into clouds, but then barrel-rolled to get behind Hirsch's assailants. They too entered cloud, but Capt Pascoe correctly guessed their exit point and positioned himself behind them with another barrel roll. The MiG pilots saw him and reversed into the F-4. In the subsequent combat, he and Wells fired three AIM-9Bs, two of them as 'out of envelope' distractions, and the fight evolved into a series of low-speed scissors manoeuvres.

At this stage the third MiG left the fight and Hirsch re-entered it. He worked his way into the No 4 MiG's rear quadrant, obtained a full-systems lock-on and fired an AIM-7D. Although the missile did not detonate, the MiG entered a near-vertical climb and appeared to stall. Both Hirsch and Strasswimmer saw the pilot's 'chute blossom.

GUNFIGHTER

For the three months up to April 1967, the badly shaken VPAF confined itself mainly to patrols over its own bases, avoiding combat with US jets, and limited in any case by the monsoon weather. There was sporadic action in March, during which F-105 pilot Capt Max Brestel became the first USAF pilot to score two confirmed kills in a single mission. They were achieved with three 2.5-second bursts of 20 mm gunfire, providing evidence for those who thought that the F-4C should have been equipped with a gun. In all, F-105 'bomber' pilots racked up 28 MiG-17 kills with their M61 cannons and two more with AIM-9s.

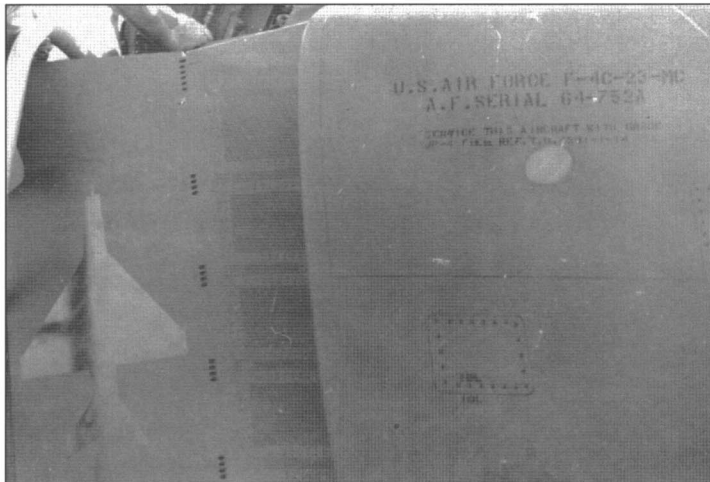
Although the gun-armed F-4E Phantom II variant had been suggested by TAC as early as October 1963, technical difficulties prevented the E-model from entering squadron service until October 1967. As an interim measure, some F-4Cs received the General Electric SUU-16/A gun pod from May 1967, the first examples going to the 366th TFW. Using the same basic M61 'gatling' cannon as the F-104 and F-105, the SUU-16/A was powered by a pop-out ram-air turbine which officially limited its use to airspeeds below 350 knots. It held 1200 rounds in a linkless feed mechanism, and was replaced on the F-4D Phantom II by the SUU-23/A model, which was powered by gun gas. The pod weighed over 1700 lbs, and was normally attached to the centreline pylon, although F-4s could also carry two on their underwing pylons for strafing.

Firing it from the short centreline pylon caused a certain amount of inaccuracy since the pod vibrated, spreading the stream of shells more widely than a fixed, internal gun. Pilots also had to allow for the slight downward angle of the pod when firing it.

Korean War ace Col Frederick 'Boots' Blesse became the 366th TFW Wing Operations boss in the spring of 1967, the wing itself being led

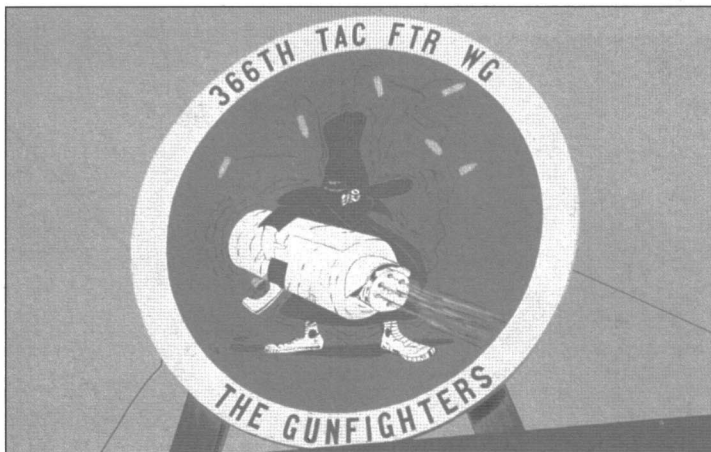
Just visible on F-4C-23-MC 64-0752 in this 1966 photograph is a large red MiG-21 outline on the jet's vari-ramp, recording its claiming of the first 480th TFS MiG kill on 26 April that year. The aircraft also boasts an SUU-16/A gun pod and an ALQ-71 ECM pod – the two most important additions to the F-4C at that time (Neil Schneider via Jerry Geer)





A close-up of the red MiG marking on F-4C 64-0752 (Neil Schneider via George Pennick Collection)

Perched on a 366th TFW hangar roof at Da Nang, the 'Gunfighters' gun pod-wielding Phantom 'spook' blazes away. The emblem's dominant colour was light blue, which was also the squadron colour of the 390th TFS. The cartoon originated from illustrations which graced the pages of McDonnell's F-4 weapons manual (via Col Jack D Morris)



by Col Bob Maloy. Blesse became an enthusiast for the gun pod, which initially proved its worth as a strafing weapon whilst flying 'in country' ground attack sorties from Da Nang.

When the 366th was brought into the war over the North in May 1967, Blesse advocated taking the pod along on CAP and escort missions. He took the idea to Gen 'Spike' Momyer in Saigon, and his response was a muted go-ahead.

Col Olds, who also met with Momyer and Blesse, was far less enthusiastic, reportedly saying to

Momyer, 'I wouldn't touch that thing with a ten-foot pole!' Thirty-five years later his reservations still held, as he explained to the author;

'The gun pod wasn't so much a speed penalty as an object of increased drag, and therefore increased fuel consumption. But that wasn't my objection to the gun pod. I refused to carry it for three basic reasons;

'1) It took the place of five or six 750-lbs bombs.

'2) Only my older and more experienced fighter pilots had ever been trained in aerial gunnery, to say nothing of air-to-air fighting. There were perhaps a dozen of them in the 8th TFW.

'3) I had no intention of giving any of my young pilots the temptation to go charging off to engage MiG-17s with a gun. They would have been eaten alive. Instead, they fought the MiGs the way I taught them, and I might say they did so with notable success. They learned that there were times to fight and there were times to go home and come back the next day.'

Maj Gen Don Logeman, a MiG-killing captain in October 1967, recalled that the drag caused by the F-4's 600-gallon centreline tank was less than that created by the gun pod;

'The gun (SUU-23/A) was somewhat sleeker than the centreline "tub", but with the open-ended gun barrels and blast deflector on its front end, the pod was indeed cruel to the Phantom II's slipstream and its fuel consumption.'

Although the 366th TFW scored the first three MiG kills of the spring of 1967, the gun was not used for them. This period of increased post-monsoon air activity on both sides marked a partial end to the US embargo on airfield attacks. Strikes were approved on Kep and Hoa Lac in April, resulting in the destruction of at least nine MiGs on the 23rd and up to 20 more in subsequent operations, with a particularly damaging strike being made on Kep on 19 May.



MiG killer 64-0797, with the serial presentation used by the 366th TFW prior to the adoption of tail codes, shares ramp space at Da Nang with an F-105D and an EC-121 in January 1967. Other F-4Cs inhabit the revetments to the right and F-100Ds sit ready to the left. Centre stage is an MJ-1 'jammer' – the ubiquitous weapons loader used by the USAF for several decades – with a four-round missile transporter to its right (via *Peter Schinkelshoek*)

Tails of two MiG killers. F-4C 64-0797/AH scored a MiG-21 for Maj R W Moore and 1Lt W D Sears on 26 April 1967, while 64-0777/AS was the F-4C used by Col Bob Titus and 1Lt Milan Zimer for their 20 May 1967 MiG-21 kill. The individual tail codes for each aircraft in the squadron meant that the usual large display of the 'last three' serial digits was unnecessary. 366th TFW rudder stripes were introduced in early 1967 and continued into 1969, whereas the 8th TFW discontinued their use when it converted to the F-4D (via *Peter Schinkelshoek*)



The MiG regiments responded vigorously to the new threat, and when 'Chicago' flight from the 389th TFS flew an airfield strike mission on 23 April, they encountered two pairs of MiG-21s. Forced to jettison its bombs and left wing tank, 'Chicago 01' followed the first pair in a climbing right turn and fired an AIM-7E that was tracking the leading MiG when both it and the missile entered cloud and the lock was broken.

'Chicago 03', flown by Maj Robert Anderson and Capt Fred Kjer ('GIB'), went for the other MiG, obtaining a full-systems lock-on and launching a Sparrow that tracked well. It struck the MiG-21 in the rear fuselage at 32,000 ft, causing a severe fire. The fighter was eventually seen to impact the ground, but no parachute was observed. It appears that the MiG pilot had been totally unaware that he was under attack.

Maj Rolland W Moore and 1Lt James F Sears ('GIB') were the next 389th TFS victors. Flying as leaders of a 26 April 'Cactus' MiGCAP flight charged with protecting a major F-105 strike on Hanoi's electricity transformers, they discovered ten MiG-21s awaiting them.

Several were flying in a defensive orbit over Noi Bai airfield, and while Moore manoeuvred into the 'seven o'clock' position of one of the 'Fishbeds', Sears set up a full-systems lock-on and they fired an AIM-7E. At the last moment the MiG pilot rolled out of his orbit and headed for the clouds, but he was a few seconds too late to avoid the missile, and destruction.

'Cactus 01' then came under heavy AAA fire as it crossed the airfield, despite the circling MiGs, and narrowly escaped a flak hit.

Da Nang F-4Cs flew their first MiG BARCAP for a rescue mission on 1 May, and Maj Bob Dilger (who flew the first gun pod sortie into RP VI with 'Boots' Blesse later that week) was leading the flight, with 1Lt Mack Thies as his 'GIB'. They were approached head-on by a flight of MiG-17s that suddenly entered a vertical climb and turned away to the right, possibly without ever seeing the F-4Cs. Maj Dilger set off after the first two and soon acquired a boresight lock-on, firing an AIM-7.

Alerted to the F-4's presence by the missile plume, the MiG pilot dived and turned hard, evading both this missile and Dilger's second weapon, an AIM-9B. By now the chase was on at very low altitude, and the pilot out-turned a second AIM-9, but when a fourth missile snaked towards his tail he misjudged his height and hit the ground in a dramatic splash of fire.

The MiG-17's manoeuvrability at low altitude and high speed was very limited. Above 400 knots down low, the aircraft could roll uncontrollably, and at 575 knots the flying controls could become ineffective. Finally, in turns of more than 3.5g, vibration and buffeting were very severe.

Maj Dilger's F-4C (63-7577) was subsequently shot down by Chinese J-5s (MiG-17s) near Hainan Island during a ferry flight from Clark AB.

Col Robin Olds' second MiG kill occurred three days later (on 4 May) when he and 1Lt William Lafever ('GIB') were leading the second of two MiGCAP flights behind a major F-105 strike just north of Hanoi. Close to Noi Bai, two MiG-21s made a diving attack on the last 'Thuds' ahead of Olds' 'Flamingo' flight, and the colonel called a warning to them before breaking into the lead MiG. With a full-systems lock-on, he ripple-fired two AIM-7Es, one of which went ballistic and the other failed to detonate. A frantic, turning fight ensued at closer range, Col Olds firing off two AIM-9s, although he did not see either missile launch.

The 921st FR pilot then reversed his turn, presenting Olds with a better target, and the third Sidewinder homed well from astern. Impacting just below the MiG's tail and starting a fire, the jet commenced a series of even more violent manoeuvres. Olds fired off his last AIM-9, which failed to get a good tone, and the colonel was then forced to leave the MiG to his wingman, Dick Pascoe, to finish off as it fled towards its Noi Bai base. However, the fire started by Olds' AIM-9 eventually rendered the MiG uncontrollable, and the jet dived into an 85 mm AAA site just short of the Noi Bai runway without 'Flamingo 02' contributing to its demise.

The elements of 'Flamingo' flight then made their own escape from Noi Bai as some unnervingly accurate 85 mm flak opened up on them. Returning to cover the last of the F-105s, they overflew Hoa Lac airfield, where six more MiG-17s were orbiting in a landing pattern. No attack was made for Col Olds was out of missiles and the F-4Cs were too low on fuel to take them on. When 'Flamingo 04' reached the tanker and (unusually) was allowed to refuel first, it was estimated that the crew had only 60 seconds of fuel remaining.

F-4C 63-7668, photographed in August 1967, displays a star denoting Col Olds' second MiG kill on 4 May 1967, when he and 1Lt W D Lafever were flying this jet as 'Flamingo 01'. Transferred to the 497th TFS when the 555th TFS switched to F-4Ds in June 1967, 63-7668 had a P painted over the Y in its tail code as part of its squadron move. A 497th FS night owl silhouette was also applied to its intake and the name *GEORGIE GIRL* stencilled onto the FS36622 grey cabin air intake. Seen here bombed up, and carrying olive drab wing tanks, the jet was passed on to the 366th TFW (like a number of other 8th TFW F-4Cs) in 1967. It was eventually shot down by 37 mm AAA on 27 January 1968 during a coastal attack near Dong Hoi (via Peter Schinkelshoek)



13 May 1967 matched Operation *Bolo* in terms of VPAF losses, with seven MiGs destroyed. Five of them were shot down by F-105Ds in a major air battle as the strike force elements, and their escorts, found themselves hard pressed to defend a 20-mile long stream of Thunderchiefs. Two 8th TFW F-4C MiGCAP flights then became involved when Maj William Kirk and 1Lt Steve Wayne ('GIB'), along with their 'Harpoon' flight wingman Charlie Woods, saw the fight and headed for it. They were covering the front of the stream at around 16,000 ft, while another MiGCAP, led by Tommy McGuire, covered the rear end.

They noticed two MiGs firing at a 'Thud'. As Steve Wayne recalls;

'The F-105 quickly accelerated away. An F-4 could easily out-run a MiG-17 at low altitude, but not as easily as an F-105 could. Our 8th TFW minimum airspeed rule when fighting a MiG-17 was 400 knots. This meant that a MiG-17 could not close on us to get a "guns" position. We were already in position to launch an AIM-9, and in fact had already radioed to the F-105 to get out of the way so that we could shoot.'

As the MiGs pulled up and swung to the left, Maj Kirk, rapidly overtaking his foe in full afterburner, switched to 'Heat' on his missile controls, got a good Sidewinder tone and fired twice. The first missile exploded around 30 ft (ten metres) behind the No 2 MiG and it spiralled down with the left side of its rear fuselage on fire. Steve Wayne continues;

'The MiGs were flying in close fighting wing formation. When his wingman burst into flames, it was probably the MiG leader's first clue that he had two F-4s on his tail. As the remaining MiG then dived for the undercast, I was able to get a full-systems lock-on and we launched two AIM-7Es at him well within parameters (i.e. not inside minimum range with a lot of overtake, which was usually the case when we were constrained by the visual ID rule). The radar lock was maintained for the missile's time of flight, at which time the radar return (i.e. the MiG) disappeared and lock-on was broken. It is my opinion that the break-lock and disappearance of the radar blip were due to the AIM-7(s) impacting the MiG. However, it had gone into low cloud, and we did not attempt to follow in order to try and confirm the kill. Thus, we were credited with one confirmed and one probable kill.'

Meanwhile, Lt Col Fred Haeffner, who had been providing high cover as 'Harpoon 03', saw two more MiGs chasing a Thunderchief. He

F-4C 63-7680/FP sits on the ramp at Ubon in July 1967 with two kills marked on its intake ramp. One was for Col Olds' MiG-21 on 2 January 1967 (when the jet was with the 555th TFS) and the second for a MiG-17 shot down by Lt Col Fred Haeffner and 1Lt Michael Bever on 13 May that same year, by which time 63-7680 had moved to the 433rd TFS. Subsequently transferred to the 480th TFS/366th TFW, the dual MiG killer did not last the year out, however, for it crashed into the sea after suffering two AAA hits during a SAM site attack on 20 November (via Peter Schinkelshoek).





The 480th TFS's 1Lt Terry Talley marks up F-4C 63-7704 after he and aircraft commander Capt Jim Craig downed a MiG-17 on 14 May 1967 on their first mission with the SUU-16/A gun pod. The 366th TFW tended to record its MiG kills on the noses of its F-4Cs rather than on the intake ramps. Col 'Boots' Blesse, the Wing Ops Officer, initiated the gun project, but had initial doubts about its feasibility. Indeed, he told the first crews who flew with the pod that they should 'consider it a bad idea, but come up with a way to make it work'. After a trial two-ship mission on 4 May, the wing was more enthusiastic about the gun pod, and four SUU-16/A kills followed soon afterwards. The 366th TFW was then nicknamed the 'Gunslingers', which was soon changed to the 'Gunfighters' (Col Terry Talley)

and his 'GIB', 1Lt Mike Bever, set up a two-shot Sparrow attack, but he inadvertently squeezed the trigger a third time. His second AIM-7 hit the target just behind the canopy and the third exploded, filling the sky with debris just ahead of Bill Kirk's F-4.

Fred Haeffner was actually on a one-week detachment from the 390th TFS/366th TFW as that wing's tactics 'boss' when he claimed his MiG, but his kill was added to the burgeoning 8th TFW total.

The next day brought three more kills for the 366th, including the first two for gun pod-armed F-4Cs. The 480th TFS was providing two MiGCAP flights for another strike by F-105s on the Ha Dong barracks, one flight spaced between the bomber formations and another trailing them. In all, they encountered 26 MiGs, and the first kill went to Maj James A Hargrove and 1Lt Stephen H DeMuth from the leading flight.

Responding to a MiG call from the F-105 leader, they saw two 'Thuds' leaving the target with four MiG-17s on their tails, and they entered a frantic, five-minute 'furball' with up to seven enemy jets, firing missiles unsuccessfully at three of them. The fourth MiG-17 was in a right-hand descending turn by the time Maj Hargrove was able to get on its tail. He opened fire with the SUU-16/A gun pod at a distance of 2000 ft, closing to 300 ft as the shells ripped into the MiG's uppersurface, causing it to explode spectacularly and break in two.

The MiG-17's strong basic structure and lack of complex systems (such as hydraulics) made it quite hard to shoot down unless hits were scored on its engine or fuel system. On the other hand, one shell from its single 37 mm cannon could disable an American fighter. Fortunately, most VPAF gunnery was inaccurate partly because of the aircraft's poor gunsight and general instability at low level in a turning fight.

Minutes later Capt Jim Craig and 1Lt James 'Terry' Talley ('GIB'), in 'Speedo 03', gunned down another MiG-17, having sighted three below them. Terry Talley takes up the story;

'For the first time we were carrying the 20 mm gun on our centreline pylon for a MiGCAP over the North. Inbound to the target, about 25 miles west of Hanoi, we were jumped by approximately ten MiG-17s, who met our formation head-on. We immediately jettisoned our external fuel tanks and turned to engage the MiGs, while the F-105s continued to the target. It was difficult to determine the exact number of MiGs in the area because there were aircraft all over the place, but it seemed that everywhere you looked there was a MiG-17 being chased by two F-4s.

'After the engagement started, we fired an AIM-7 at a MiG but it failed to guide. Another MiG rolled into our "six o'clock" to try and get a tracking position, but we pulled the F-4 into the vertical and he didn't have the power to follow so he broke off his attack. Jim then spotted another MiG and we attacked. While we were manoeuvring on this MiG, a SAM came whizzing over our left wing and exploded about a quarter of a mile away in a big, brown cloud. I don't know what the SAM operators were shooting at, since there were jets all over the place, but it came close enough to us to really get our attention. After it passed us we continued manoeuvring on the MiG and fired another AIM-7, but the MiG out-turned it.

'Jim then performed a barrel roll to get space on the MiG, rolling in on him again and selecting the 20 mm gun. The MiG was in a right-hand turn in a wheel-like formation with two other VPAF jets. Jim started tracking

366th TFW F-4Cs knocked down three MiG-17s on 14 May 1967, two of them with the SUU-16/A gun pod. The wing commander, Col Jones E Bolt, had secured 16 pods for his 55 F-4Cs by then. In this group photograph, six 480th TFS members celebrate the three kills of 14 May. They are, from left to right (rear), Capt Jim Craig, 1Lt Terry Talley, (front row) Capt Bob Lambert, Maj Sam Bakke and Jim Hargrove and 1Lt Steven Demuth. Dimly visible beneath the F-4C's worn, green painted vari-ramp is a Singhai lion stencil, suggesting the jet's previous ownership by the 497th TFS at Ubon (via Col Terry Talley)



it and fired. The MiG immediately burst into flames right behind the cockpit, rolling inverted and diving towards the ground. We last saw it going 90 degrees nose-down, still on fire. It disappeared into low cloud cover, the pilot having made no attempt to eject.'

Some 366th TFW crews had previous experience with the gun to draw on, as Terry Talley explains;

'A lot of pilots in the wing came from previous F-4 assignments in Europe (including myself). Jim Craig came to Da Nang from Germany, where he flew F-105s. In USAFE, we would go down to Wheelus AB, in Libya, and do air-to-ground and air-to-air training. This included firing the gun against a dart target towed by another aeroplane. We initially used the gun on (air-to-ground) missions in South Vietnam. There wasn't a problem with the downward angle of the gun pod mounting, but Jim Craig had to use a little "Kentucky windage" as far as leading the MiG was concerned since the F-4C gunsight was very basic and was not capable of lead-computing. The speed limit on the pod wasn't a real handicap either, for we ingressed to the target at over 400 knots, but when the fight started, our speed decreased with all the turning and manoeuvring.'

In the trailing 'Elgin' MiGCAP flight, the lead aircraft was flown by Maj Sam O Bakke and Capt Robert W Lambert ('GIB'). Maj Hargrove (who had survived being shot down by AAA in F-4C 63-7709 on 27 January 1967) alerted them to the MiGs, and they took 'Elgin' down from 17,000 ft to their 6000-ft orbit. Their first attack was frustrated by two AIM-9Bs that failed to guide, and a second attempt was discontinued when a MiG out-turned them. Bakke then went after two other MiG-17s at his 'ten o'clock' and Lambert got a radar lock-on to a target on the outside of their left turn. Holding it in his gunsight reticle, Bakke squeezed his trigger for an AIM-7 shot. Instead he got a 'break-X' indication on his radar scope, showing that the MiG was inside minimum AIM-7 range, since the interlock switch was set to the 'in' position.

In this configuration the missile could not be fired unless all the requisite parameters were satisfied. Drawing back, with throttles at 'idle', to gain adequate separation from the target, Bakke saw that the allowable steering error (ASE) circle on his 'scope was small, indicating minimum Sparrow range, with the steering dot in the centre of the circle. He ripple-fired a pair of AIM-7Es and the second caused an explosion in the MiG-17's right wing root. It stalled and fell away into the clouds on fire.

Photographed at Da Nang in September 1967, F-4C-23-MC 64-0806 of the 489th TFS/366th TFW wore this 'Gunfighters' emblem, along with four MiG kill stars denoting the victories scored by 480th TFS crews that year (Neil Schneider via George Pennick Collection)



MAY MASSACRE

During a four-day period in which tussles with the VPAF continued without any actual MiG losses, the US Navy began attacks on new, heavily defended targets in Hanoi itself, losing six jets and ten aircrew on 19 May 1967. The following day, however, the MiG kill total leapt ahead in one of the biggest battles of the war, described by Col Robin Olds as 'an exact replica of the dogfights of World War 2'.

For the first few months of 1967 F-4s had been flying a greater proportion of strike missions, boosting the diminishing numbers of F-105s, 225 of which had been lost by 1 May. From then onwards, with good weather and increased MiG activity, F-4s reverted increasingly to the MiGCAP role. Phantom II flights accompanied the strike force, rather than setting up CAP stations in advance to block MiGs as they took off. As the USAF's *Red Baron* study concluded after *Rolling Thunder*, 'achieving a position to attack first was probably the most significant predictor of success in an attack'. Both sides varied their tactics in order to try and achieve that advantage, and this re-positioning of MiGCAPs at least gave the chance of a quicker response to approaches by MiGs.

No fewer than 26 MiGs were claimed by USAF and US Navy fighters during May for the loss of only two Phantom IIs in 72 air combat encounters.

Six of the VPAF fighters were destroyed on 20 May by the 8th and 366th TFWs. The targets on that day were the Kinh No vehicle repair centre (covered by the 366th TFW) and the frequently attacked Bac Le railyards (for the 'Wolfpack' MiGCAP). A pair of MiG-21s dived on the departing F-105s, and the 366th TFW's 'Elgin' flight, led by Maj Robert D Janca and 1Lt William E Roberts Jr ('GIB'), closed on them.

The flight was to have been led by Lt Col Robert F Titus (who had flown *Skoshi Tiger* F-5As at Bien Hoa the previous year), but he was pulled from the lead by 'Boots' Blesse. Titus recalled;

"Boots" Blesse told me that I could not lead the mission, which I had scheduled myself. I had just returned the night before from the Fighter Symposium at Nellis AFB. He informed me that the wing had "changed tactics" during my one-week absence, and therefore I could not lead. I woke up Bob Janca and told him to get ready to fly lead. He objected, claiming a hangover, whereupon I told him to report for duty or he wouldn't fly again. I wanted him on the mission as he was one of my best.'

Titus flew as 'Elgin 03' (with 'GIB' 1Lt Milan Zimer) instead. As the strike force moved in, he suddenly saw the diving MiGs;

An overall red/white striped rudder design was 389th TFS CO Robert Titus' innovation to identify individual F-4s. The original plain camouflage caused confusion in the air when crews attempted to pass on warnings to each other in combat, or tried to maintain the correct sequence for refuelling on a tanker. The pattern seen here on F-4C 64-0748 was later reduced in size when code letters were introduced (George Pennick via Peter Schinkelshoek)



After its service with the 8th TFW, Col Olds' double MiG killer 64-0829 passed (like several other 'Wolfpack' F-4Cs) to the 12th TFW at Cam Ranh Bay in December 1967. It is seen here wearing the XC codes and red fin cap of the 557th TFS 'Sharkbaits', although its MiG-kill record seems to have been temporarily overlooked (via Robert F Dorr)

'Of course, we were always scanning for them, and expected to see them at any time. The limited help from radar or other sources was of small utility. When I first spied a MiG I called Janca and informed him that I was engaging. He turned to cover my element. It was only on egress that I learned that he had subsequently made a kill.'

Janca's AD-coded F-4C had been carefully manoeuvred into a firing position, and an AIM-9B was released from 4000 ft behind a MiG-21, with a perfect clear sky background and zero angle-off. The missile made a textbook run to its target and blew a chunk off its tail. The MiG lurched into a spin and the crews of 'Speedo 01' and '02' saw it hit the ground.

Meanwhile, the other 'Elgin' element was chasing a pair of MiG-21s, but Bob Titus and Milan Zimer had to abandon their pursuit. 'I had to let the first one go when my wingman Stu Bowen called a break', recounted Titus. However, they soon picked up a third MiG nearer to the strike force, and 'Elgin 03' fired three AIM-7Es with full systems lock-on. The third slammed into the MiG-21's right flank with a bright blossom of fire, and a parachuting pilot was seen descending with the flaming wreckage.

Unlike the 8th TFW, where pairs of AIM-7s were normally fired in each engagement, Titus remembers that the 366th TFW observed no such rule; 'We had no established policy with regard to missile firing. Each situation was different, and it made no sense to me to specify such details. After we nailed this MiG-21 I engaged a third MiG, but had to let him go so as to cover Bowen, who had turned to egress because he was seriously low on fuel. Were it not for the tanker leaving his orbit to assist, Bowen would probably have had to eject over Laos.'

Of the four confirmed 8th TFW kills scored that day, two were credited to Col Olds, making him the top-scoring pilot of the *Rolling Thunder* years. The Ubon Wing put up two MiGCAP flights, with 'Ballot' (led by Maj Phil Combies) flying line abreast with the second F-105 flight and Col Olds' 'Tampa' flight positioned high and two miles to the right of the final four 'Thuds'.

Both Phantom II flights punched off their external tanks as they cruised in from the Gulf of Tonkin at 480 knots. MiG warnings were received as they approached Kep airfield, and MiG-17s were sighted by both F-4 flights 15 miles from the two Bac Le targets. A major fight ensued, with up to 14 MiG-17s being engaged by the F-4s while the Thunderchiefs



went on to hit their targets. By the time the dogfighting ended after six furious minutes, four more MiG-17s had been destroyed.

'WAGON WHEELS'

Maj Bob Pardo and 1Lt Steve Wayne ('GIB'), who were flying the third F-4C in Col Olds' 'Tampa' flight, spotted a 'wheel' formation of around 14 MiG-17s orbiting in a shallow 'bowl' formed by hills to the north of Haiphong. VPAF pilots had realised that American air-to-air missiles were less effective at low altitudes, as Bob Pardo explained;

'Ground clutter on the radar made for a difficult lock-on, and didn't provide a well-defined beam for the AIM-7 to ride. A clear background gave a sharp radar return and a well-defined beam. The same was true for the AIM-9s – the closer to the ground, the more sources of heat were available to confuse the tracking computer.'

At sea level, the AIM-7's maximum range was reduced from 6000 ft (at an altitude of 10,000 ft) to 4000 ft, and the radar 'cone' within which it could be fired shrank from 40 to 30 degrees.

The MiG 'wheels' (based on Soviet tactics) were positioned on the most-used F-105 routes, and the VPAF fighters would climb out from them to attack, before returning to the mutually defensive 'wheel'. There, they could orbit, spaced around the 'wheel's' circumference, in such a way as to try and lure an F-4 into turning behind them in the circle. Any Phantom II that took the bait would then come under attack by the next MiG in the 'wheel', or by one on the opposite side of the circle.

The MiGs' low altitude was intended to prevent F-4s from getting below them for a good missile shot against a sky background, while the jets' shorter-range gun armament also gave them an advantage, as Steve Wayne remembers;

'The MiGs were spaced in flights of two, looking much like a wagon train being attacked by Indians – the F-4s were the Indians. They were very disciplined, and did not deviate from their "wheel". Whenever we manoeuvred to get behind two MiGs, we put ourselves in front of two others. The object was to launch a successful missile shot before the MiGs behind us got in any good gun shots. Luckily, they were using tracers, which made it a lot easier to time a breakaway and reposition. We didn't slow below 400 knots and try to get into a turning fight with the MiGs. Instead, our attacks were made at "high overtake" speeds, which gave us time for a quick shot or two, before we hastily zoomed away and repositioned for another attack.'

Usually, one or two MiGs would be positioned at higher altitudes as 'directors' to warn the 'wheel' of imminent attack, or to tell pilots when to break out of the circle and attack the strike force. Bob Pardo described the opening stages of 'Tampa's' engagement;

'I spotted the "wheel" and called it out to Col Olds. He started to

Bob Pardo and Steve Wayne flew F-4C 63-7623 as 'Tampa 03' on 20 May 1967, with FG codes, for their MiG kill. It was eventually displayed in Steve Wayne's hometown of Fairmount, Indiana, in April 1995 (via Col Jack D Morris)



accelerate and descend because one of the MiGs had left the circle and commenced an attack on the last flight of F-105s. Before it opened fire, Col Olds called that two MiGs were attacking our formation from “eight o’clock high”. These must have been the “controller” MiGs.

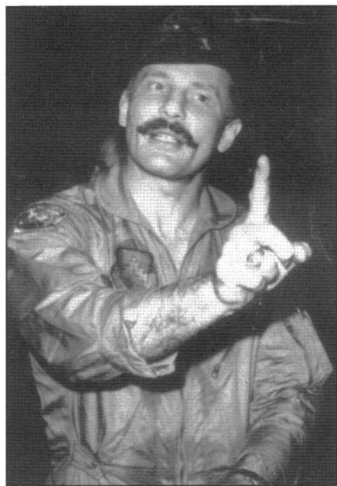
‘Col Olds said he would take this high flight, and for me to press the attack on the MiG that had threatened the F-105s. The latter started to shoot at them as we closed on it. We were able to get a radar lock and launched a Sparrow, which flew out about 300 ft and then went straight down into the ground. We switched to “Heat” and launched a Sidewinder that guided to within about five feet of the tailpipe of the No 4 MiG-17. It exploded, causing fire to vent out of the side of the fuselage and smoke to pour out of the tailpipe.

‘Simultaneously with this hit, my back-seater Steve Wayne (who had already shot down a MiG-17 on 13 May with Maj Bill Kirk) called, “Two MiGs shooting at us from ‘eight o’clock high!’” I called for our element to break left. We went into afterburner and started a climbing turn at 6-7g. That negated the MiG attack, and we started descending back into the “wheel”. We dropped down to an altitude of just 100 ft to get below a MiG that we had selected as he started a left climbing turn. There was so much ground clutter on the radarscope that we went full boresight, put the pippin on him and got a “burn through” on the radar for a full systems lock-on. As we were tracking him in his turn, we saw van Loan’s aeroplane going straight up with fire streaming out of its fuselage and exhausts, the flames extending some 50 to 100 ft. We pressed to within 200 ft of his jet.’

Maj Jack Lee van Loan and ‘GIB’ 1Lt Joseph ‘Hoss’ Milligan were protecting Col Olds’ tail when their F-4C (63-7669) was apparently hit in the wing by gunfire from one of the MiGs, although the VPAF made no claim. The Phantom II caught fire and broke up, forcing both men to eject into captivity. Van Loan was the 433rd TFS intelligence officer, and he suffered badly at the hands of his captors.

‘Just as we were about to launch our second Sparrow’, Bob Pardo continued, ‘Steve called “Two MiGs shooting at us from ‘eight o’clock!’” I launched the missile and started a hard turn into the attack. After negating the jet’s first attack, I came out of afterburner and didn’t use it again, for I knew that if this was the way the fight was going to progress, I could fly in military power and leave reheat for my wingman to handle the heavy manoeuvring that was bound to follow each attack. Meanwhile, my AIM-7 appeared to guide. We had been taught that at minimum range, we could shoot and turn at “g” without breaking lock before missile impact. Because we were evading two attackers I did not see whether the missile hit the MiG or not.

‘Again, we descended into the “wheel” to push one of the MiGs up and out of the circle so we could get a shot. This time a MiG-17 pulled up before we got below him, or very close to him. He wasn’t pulling many “g”, and we had no trouble getting behind him. We got a lock-on and were about to fire when he saw us and made a maximum “g” turn to the left. As we started to go with him, I saw van Loan and Milligan floating down beneath their parachutes. The MiG’s turn was too tight to follow without hitting our guys, so we broke off to the right and went past them at a distance of no more than 200 ft. After we were clear, we resumed our left turn and went back down to get another MiG.’



Col Olds lays it on the line. His reputation as a Phantom II leader preceded him at Ubon. Alex Martin, who flew F-4s with him in the 81st TFW at RAF Bentwaters in early 1966, saw him as 'one of the men I respected most in my career - an ace, married to a movie star and a true fighter jock' (USAF via Col R Thurlow)

Following their first three passes (including the initial MiG kill), Pardo and Wayne made no fewer than seven more attempts to get their second kill! On their fourth pass their AIM-7 went ballistic, then another Sparrow failed to leave the aircraft. Pass number six was frustrated by 'Tampa 04', as Bob Pardo explains;

'I fired a Sidewinder which went ballistic because my wingman flew across my nose, between me and the MiG I was tracking - he was so close that it caused me to flinch. The missile had broken lock because his aeroplane blanked out the heat source. Luckily for him, he was so close that the AIM-9 didn't have time to switch to his source because he was also inside minimum range.'

Two more Sidewinder passes proved equally as unsuccessful because neither missile was seen to launch after firing. In Steve Wayne's opinion; 'Our other missiles (after the MiG kill) were fired with too much overtake and/or inside minimum range. Our confirmed kill resulted when the MiG was so low that he had to pull up to clear a hill, providing a perfect clear sky background for a successful AIM-9 launch.'

Maj Pardo then made two final 'dry' passes after all his missiles were expended;

'The dry passes were just like the "hot" ones except we had our speed up to about 650 knots IAS. As we got in close, we would move just to the right as we went by a MiG, passing as close as ten feet and rolling into a 90-degree bank as we went by. Steve would give the MiG pilot the finger, and as soon as we had clearance I would pull across his nose with about 7g, trying to create enough turbulence to throw him out of control! To our knowledge it didn't work. During our second dry pass Col Olds called bingo fuel, and as we started outbound my wingman joined up on us.

'About 15 miles from the coast I spotted a lone MiG. Since I had nothing to shoot I told my wingman to take him, but he declined due to his low fuel state. At about that time Olds told us to continue to the tanker and he would see us there. He had also seen a lone MiG and wanted to get it.'

This MiG-17 became Col Olds second kill (fourth in total) in what he described as a 'quite remarkable air battle' in which the possibility of collision with another aircraft was almost as dangerous as being hit by a missile or cannon shells. This was further increased when two additional flights of MiG-17s joined the fight. As Bob Pardo commented, 'There were at least 16 missiles fired and hundreds of 27 mm and 37 mm cannon rounds expended. You might say it got a little crowded'. AAA from Kep was also shot into the air whenever the F-4s' low altitude manoeuvring took them across the airfield.

Robin Olds had gone after the MiGs in the 'wheel' following the initial contact in which his wingman had gone down. Unperturbed, he lined up on a MiG at a range of 7000 ft on his fourth pass and his back-seater, 1Lt Steve Croker, managed a full systems, narrow gate lock-on with interlocks in. One of the two Sparrows he launched guided successfully and detonated close to the MiG, sending it down with a bright trail of fire. 'Tampa 01' then made repeated attempts to nail another MiG in the circle, but low fuel eventually drove Col Olds to seek the tanker. However, he had noticed the 'lone MiG' that he mentioned to Bob Pardo during his previous lunges into the 'wheel', and as the remaining elements of his

flight rejoined on their way back south, he made some speedy fuel state calculations and headed north after the MiG.

Approaching at a height of just 50 ft, Olds escaped detection until virtually behind the MiG-17. When the pilot finally spotted the F-4, he made for the range of hills between their position and his Kep home base. Col Olds continued to hunt him down as the MiG pilot threw his fighter around the skies in desperation, before finally entering a narrow valley. The Phantom II pilot knew that his quarry would have to climb and cross a ridge at the end of the valley, silhouetting himself briefly against the sky, and thus making an ideal target for a Sidewinder – the last missile aboard his F-4C.

The MiG duly climbed and then turned, at which point the AIM-9B exploded close to its rear fuselage, turning it into a flaming wreck. Col Olds then headed back to the ‘gas station’ in a hurry.

Bob Pardo recalls, ‘When I got to the tanker I had 1000 lbs of fuel left, as did my wingman. Col Olds had about 600 lbs – about six minutes’ flying time – when he got there.’

That day’s fourth confirmed kill was the second for Maj Phil Combies, who was leading the other 433rd TFS MiGCAP flight. By Bob Pardo’s reckoning, Combies’ ‘Ballot’ flight was more than 24 miles ahead of the ‘Tampa’ F-4Cs and their MiG scrap;

‘His engagement occurred very shortly after ours began, with MiGs that just appeared in front of him. Phil Combies told me that as he initiated his attack, the MiG started to descend to get below the cloud deck. His missile hit and the MiG then disappeared into clouds (at his debrief Maj Combies reported flames trailing from the MiG). He descended below the cloud base to look for the MiG but couldn’t find him, and he did not actually claim a kill. He stayed in the general target area until most of the strike force had bombed, and then started to escort them out. Our fight was still going on.

‘Because the fight had been so wild, the results were unsure. We landed and went to debrief. Col “Chappie” James more or less designated himself as the Kill Board, and he stepped out of the room for a while, came back in and awarded Olds two MiGs and Combies and me one each.’

In Bob Pardo’s opinion that still left at least one MiG unclaimed, since he is certain that there were five fires on the ground from crashed aircraft – one from Olds’ MiG, one from his and one from van Loan’s F-4, plus two others;

‘Combies’ kill took place at least 20 miles north of the battle area, and Col Olds’ didn’t get his second until after I had departed the area. If “Chappie” had listened more closely to my debrief, he could have easily awarded Olds three MiGs, making him an ace. He may very well have got another without knowing it if his fight was anything like mine. We each had a makeshift gun camera mounted in our aeroplanes that day, but none of us had time to turn them on. Too bad.’

The issue of Col Olds’ potential ‘ace’ status caused him some concern at this time, since he had heard unofficially from Seventh Air Force HQ that his tour would be ended when he achieved his fifth kill so that his publicity value could be exploited in the USA. He knew that this would mean promotion out of the cockpit, which was his natural ‘home’, and he therefore passed up a number of opportunities to score his fifth victory,

rather than lose his job. The USAF had to wait until 1972 for its only two aces of the Vietnam War.

THE BIG PUSH

For Bob Pardo 20 May 1967 was the most exciting day of his life;

‘The thing that surprised me most was the absence of fear. I was finally doing what I had wanted to do, and had trained to do, for so many years, and I was doing it with Robin Olds. What more could a young fighter pilot ask for? The F-4 was an awesome aeroplane in combat. If you knew how to fly it, and use energy manoeuvrability, it could do anything. It could even push a 28,000-lb aeroplane on a piece of one-inch thick glass.’

Bob discovered this facet of the Phantom II’s capability on 10 March 1967 when he and Steve Wayne were No 2 in a ‘tailend Charlie’ flight covering a strike on Thai Nguyen steel mill;

‘Over the target, the No 4 jet and I were both hit by AAA. No 4, flown by Capt Earl D Aman and 1Lt Robert W Houghton (in F-4C “Cheetah 04” 63-7653), was critically low on fuel coming off target, and it was obvious that the jet would not make it out of North Vietnam. After Aman had climbed to 30,000 ft, I had him lower his tailhook, which I put against my windscreen and I then pushed him for 88 miles (after Aman had shut down his engines), getting him over the jungles of Laos, where he and his back-seater ejected. Two minutes later we too ran out of gas and ejected (from ‘Cheetah 03’ 64-0839, which had been the F-4C used by Dick Pascoe and Norm Wells for their 6 January 1967 MiG kill). We were all rescued, with two broken backs, a broken neck and cuts and bruises, but we each flew about a hundred additional missions.’

‘Pardo’s Push’, as it was dubbed, was frowned upon by senior staff (although Col Olds was on leave at the time), who believed that Bob Pardo should have abandoned his stricken wingman and sought out a tanker for himself. A briefing team was duly sent round the F-4 bases to discourage similar attempts. Bob Pardo and Steve Wayne had to wait 22 years for the award of the Silver Star for their act of courage.

At Da Nang, ‘Boots’ Blesse was encouraged by the 366th TFW’s two SUU-16/A gun victories in May. Apart from the increased opportunities to catch MiGs at close quarters, the gun was also cheaper than a missile. As if to prove this point, Col Blesse calculated that Bakke and Lambert’s kill on 14 May, using an AIM-7E and an AIM-9B, cost the tax-payer \$46,000, whereas the other two kills that day, involving only 336 rounds of 20 mm, cost a mere \$1680 for the pair! He passed this observation on to Seventh Air Force HQ and it caused some annoyance when it was relayed to Ubon RTAB!

With Operation *Bolo* and 22 MiG kills to its credit by 20 May 1967, as opposed to ten victories for the 366th TFW (plus four for its 480th TFS as a 35th TFW unit), the 8th TFW was attracting more media attention than the Da Nang squadrons. Col Blesse decided to concoct a ‘brand image’ that would rival the 8th TFW’s ‘Wolfpack’ nickname, and he summoned a meeting of his weapons section and squadron commanders;

‘After a three-minute discussion, I told them that no one was going to leave the room until we had a new insignia and a new name. Finally, one of the guys blurted out, “I’ve got it! How about the “Gunfighters of Da Nang?” Maj Ed Lipsey of the weapons section (headed by Maj Fred



F-4C-24-MC 64-0820 was assigned to Lt Col Titus as commander of the 389th TFS and 1Lt Milan Zimer in May 1967. It bears their three MiG kill markings, which were actually scored in two other F-4Cs. This jet also flew with the 480th TFS, where it was marked with CS codes (Neil Schneider via Jerry Geer)

Haeffner, CO of the 390th TFS) suggested using the McDonnell “spook” cartoon, originally featured in the F-4 maintenance manual. The famous “Gunfighters” patch was duly born following the simple addition of an underarm gun pod. Sixty large decals were donated for application to the Phantom IIs’ intake flanks, and a giant version was painted on a hangar roof at Da Nang.’

As Terry Talley explained, ‘Before our kills on 14 May, the “Gunfighters” idea didn’t exist. I recall my squadronmate Capt Chuck Colton, who was pretty good at drawing things, sketching up the figure of a “Phantom” holding a gun pod, and things took off from there.’

Appropriately, two of the next three Da Nang MiG kills involved the gun pod. Two of these added to the scores of Lt Col Titus and his ‘GIB’ 1Lt Zimer, and saw a second and third red star applied to F-4C 64-0776/AK. This versatile Phantom II had destroyed three MiG-21s – one with an AIM-7, one with an AIM-9 and one with gunfire.

On 22 May Robert Titus had led ‘Wander’ flight on a MiGCAP for an F-105 strike against Ha Dong barracks and a supply depot in Hanoi. Increased MiG activity caused the introduction of a second MiGCAP flight nearer the front of the strike formation. Later, it was realised that the usual MiGCAP location right at the end of the formation could itself become a MiG target.

Flying abreast of the second F-105 flight at 16,000 ft, Lt Col Titus saw a pair of MiG-21s ahead of them. He instructed his ‘GIB’ to ‘go boresight’ and called that he was ‘padlocked’ (committed to attack). With external tanks already jettisoned, Titus engaged afterburner and set off after one of the MiGs, but he could not persuade his radar to lock on successfully. Rejoining the F-105 strike force, Titus saw another ‘Fishbed-C’ fire an ‘Atoll’ at a ‘Thud’ and then climb away as his missile broke lock and failed to connect.

Following the MiG to 20,000 ft in a 50-degree climb, Bob Titus got a good AIM-9 tone and fired at a range of about 1500 ft. Both MiG and missile disappeared into cloud, and when the F-4 emerged above the layer of undercast, its crew found only smoke and debris where the VPAF jet should have been. Members of the other F-4 flight and several F-105 pilots later confirmed the kill, having seen a wing come off the MiG-21 as Titus’ missile found its mark.

Unaware of this, ‘Wander 01’s’ crew headed off after another silver MiG-21 and fired a second Sidewinder. The VPAF pilot put on a ‘startling display of flying’ to try and lose the F-4, and both fighters were soon in a supersonic dive, heading for Hoa Lac air base and its deadly SAM and AAA defences. Lt Col Titus decided on a gun attack;

‘He started pulling out of his dive and I pulled the gunsight pipper though him and out in front because we had no lead-computing gunsight – just a depressible pipper – so I had no idea how much lead I needed. I just pulled the trigger and eased the pipper down, figuring it would hose

him. I pulled and rolled back for another pop, but the gun had jammed. I pulled off again as he conveniently impacted.'

Both 'Wander 01' and '02' watched the MiG descending, with wings rocking slightly, until it hit a riverbank and disintegrated in flames. Both F-4s were by now very low on fuel, yet they managed to avoid heavy AAA and five SA-2s as they left the area. 'Wander 01' had fired 235 rounds of 20 mm to destroy the MiG.

One of the reasons for Lt Col Titus' loss of his first MiG target was distraction by a babble of radio transmissions from which he could have deduced all manner of confusing warnings from sources outside his own flight. As he explained, 'Radio chatter was always a problem. My policy was to call the flight over to "Squadron Common" – a pre-arranged frequency – when things became too noisy'. Many pilots also found the repetitive, non-specific, high-volume MiG warning transmissions from the 'Disco' EC-121 Airborne Early Warning aircraft less than helpful during the early war years. Col Olds' solution was simple;

'The only improvement I wanted was for most of those transmitting on our strike frequency to get the hell off the air. As a matter of fact, I used to turn off "Guard" channel (used for emergencies, rescues or as a second radio) as I crossed the Red River. It was far more important to hear a transmission from "Green 04" than to have "Motel" announce that there happened to be a MiG or two in "Alpha Golf Two" (4500 cubic miles of space). Some years later "Motel's" information was more to the point. They were allowed to give specific direction and distances. That certainly made life easier for the crews flying during *Linebacker* than it had been for us. We fought the MiGs when they hit us, and that was that.'

'Motel' was the callsign for the Tactical Air Control Center's North Sector at Da Nang AB, which monitored all USAF activity over Route Packages V and VI.

Three more MiG-17s were shot down on 5 June. One of these proved to be another 'Gunfighters' victory, this time for the 480th TFS 'Warhawks', whilst the second kill marked the final aerial success for the F-4C.

The 480th's Maj Durwood K Priester and Capt John Pankhurst ('GIB') were heading the 'Oakland' MiGCAP flight when, inbound to the target, they saw three MiG-17s low on their starboard side. Diving from 17,000 ft down to the MiG's altitude of 8000 ft, Maj Priester spotted the third MiG beginning a steep climb, so he positioned himself behind it and gave the jet a short burst from his SUU-16/A as the enemy fighter made a steep climb to the right. Observing no hits, Priester fired again – without even using the

Phantom IIs at South Vietnamese bases were always vulnerable to Viet Cong mortar and rocket attacks. A particularly severe assault on Da Nang AB on 15 July 1967 cost the 389th TFS six F-4Cs destroyed and twelve badly damaged. More would have been lost had Col 'Boots' Blesse and Col H Brennan not organised the unloading of a bombed-up Phantom II before its lethal cargo could explode. F-4C-16-MC 63-7432 is seen here taxiing past a suspicious looking column of oily black smoke at Da Nang (Robert F Dorr collection)



primitive gunsight in his F-4C – as the MiG pilot reversed his turn. This time two balls of flame shot out from the MiG's tailpipe and the jet dived, wings level, into the ground with the pilot still aboard.

Several minutes later Capts Dick Pascoe and Norm Wells ('GIB'), flying as wingmen to Col Olds' brand new F-4D, scored their second MiG kill just after hearing of Priester's fight. Col Olds took his 'Chicago' MiGCAP flight straight into the melee, where there were now four MiGs duelling with the 'Oakland' Phantom IIs and two solo VPAF fighters orbiting above them at their 'nine o'clock' and 'three o'clock' positions.

Olds' element went after the MiG on the left beam while the remaining two 'Chicago' F-4s took the second solo bandit ('Chicago 01's' subsequently frustrating experience with the AIM-4 Falcon missile at this stage in the engagement is described in detail in the next chapter). Olds' then passed the lead to Pascoe and Wells' in their F-4C, which was armed with AIM-9Bs rather than the temperamental Falcons.

Ironically, Dick Pascoe had actually been scheduled to lead 'Chicago' flight that day, but had been relegated to Col Olds' wingman by the 8th TFW CO himself. He remembers;

'He did this from time to time, as was certainly his prerogative as wing commander. Col Olds opted to take the lead and fly the AIM-4-configured F-4D. This he did immediately prior to briefing time. Not wanting to be left out of the fight, I told the No 2 crew that Norm Wells and I would fly the colonel's wing in an F-4C loaded with Sidewinders. The colonel told me after his second MiG kill, when I had also given up the lead for his wing position, that he would be on my wing when I got my second kill. And so he was!'

Capt Pascoe followed the MiG (that had escaped all Col Olds' missiles) into a climb, having acquired it on radar – its rear profile was too small to provide the pilot with a visual ID. By the time the MiG turned, enabling the crew to finally see it, they had overrun the AIM-7's minimum firing range and were close to the minimum for the AIM-9B as well. Pascoe fired two Sidewinders, both of which struck the jet's rear fuselage, causing the MiG to roll left and crash into the ground before its pilot could eject. The fighter had been below a 'wheel' formation, heading home alone.

The heavy losses sustained by the VPAF in May and June 1967 – 32 victories were claimed by USAF and US Navy crews during this period – were devastating to this small fighting force. By the end of June the number of qualified pilots within the two fighter regiments had fallen below the level required to successfully man one unit, and morale among new pilots was at a low ebb.

The VPAF's six fighter airfields were now also being regularly attacked, and on 19 May a number of MiGs sustained serious damage during a strike on Kep. A stand-down was ordered on 5 June, after which MiG pilots confined themselves to practice interceptions and on-going attempts to destroy EB-66 jamming aircraft. There were no further encounters with US fighters until late July, and Gen Momyer reported to a Senate sub-committee that his forces 'had driven the MiGs out of the sky for all practical purposes'. His judgement proved premature, as 16 more MiGs would be shot down in a series of intense air battles prior to the cessation of bombing of the North in 1968. Moreover, by then the VPAF fighter pilots had shifted the balance of kills and losses in their favour.

F-4D AND AIM-4D

In late May 1967 the first examples of the new F-4D Phantom II variant arrived at Ubon for the 555th TFS. In the D-model, the emphasis was on much better bombing capability.

Block 26z-33ag aircraft had the first fully operational F-4D avionics suite, including the General Electrics (GE) AN/ASG-22 lead computing optical sight set (LCOSS) in place of the primitive, manually-depressed sight in the F-4C. These aircraft were also wired for GE's SUU-23/A gun pod. Although the new variant was designed mainly to be a better tactical bomber, it became the most successful MiG destroyer in the Vietnam War, with 44 kills to its credit.

Early F-4Ds also had an important alteration in their secondary air-to-air armament. While the AIM-7 Sparrow was retained, AIM-9 Sidewinder wiring was removed and replaced with equipment for the Hughes AIM-4D Falcon missile. The latter were mounted in pairs on 'slant two' LAU-42 launchers that contained piping for gaseous nitrogen cryogenics to cool the missiles' infra-red seeker heads. The installation was tested at Eglin AFB in late 1965 during Project *Dancing Falcon*, and on paper at least, the missile gave better detection capability than the AIM-9B and an expanded acquisition envelope.

The Falcon had been used by Air Defense Command since its IOC (Initial Operational Capability) in 1956 as the world's first fully guided air-to-air missile, and its development dated back to 1947. The USAF's selection of the weapon as its close-in, dogfighting missile was reinforced by inter-service rivalry, since the AIM-9 was very much a US Navy-led programme. In Brig Gen Robin Olds' opinion;

'The word was that the Air Force, in a fit of righteousness, wanted an air-to-air missile they could call their own. The powers in Systems Command must have tired of having to kowtow to the Navy in testing and improving the AIM-9. They wanted a missile of their own devising, and picked the existing AIM-4 as a solution. What a farce!'

His reactions were based on bitter experience with a missile system that demonstrated big technical problems from the outset. These centred around the comparatively long cooling time (at least 4.2 seconds) for the Falcon's seeker head, which meant that the AIM-4 could not be set up for a quick lock-on and launch during a dogfight. The missile was inoperative once its liquid nitrogen coolant had been used up.

The USAF's *Red Baron* report described the firing process for the

The bulky 'slant two' carriage arrangement for two Hughes AIM-4D Falcons is best appreciated in this head-on view of F-4D 66-7466, which also wields an SUU-23/A gun pod (Author's Collection)



AIM-4 as the most complex for any aerial missile in its entire inventory. A further problem was its lack of a proximity fuse (unlike the AIM-9B), which meant that a direct hit was required with the small, 7.5-lb explosive warhead in order to achieve a kill. Because of the missile's disappointing performance in combat with the 8th TFW, a later AIM-4H version of the weapon was dropped.

The US Navy, meanwhile, simply went ahead with developing an improved Sidewinder (the AIM-9D), which had a much better hit rate than the AIM-9B. The latter had been moderately successful in use with the F-4C, but a better missile was certainly needed. Maj Gen Dick Pascoe had experience of both the early Sidewinder and the Falcon in combat, and was fully aware of the shortcomings of both weapons;

'On my 6 January 1967 mission (described in Chapter 2), I was able to maintain a position of advantage behind the second element of MiG-21s after I had shot the leader down. However, even though I fired three AIM-9s during the turning engagement, none found the target due to the weapon's limitations. To address this generally recognised deficiency, a decision was taken to adapt existing AIM-4s to the F-4 as a potentially enhanced dogfighting weapon. Having flown the AIM-4-equipped F-102, I was familiar with the Falcon's characteristics and limitations. Unfortunately, the AIM-4 was declared unfit (at Ubon) before I was able to convince the 8th TFW of its merits.

'While the Falcon's flight dynamics were better than the AIM-9's, the arming and firing process was more complex – certainly in a dogfight environment. The AIM-4 was a hit-to-kill weapon, and to achieve the required accuracy it used nitrogen to super-cool the seeker head before launch. This design is effective, but adds a degree of complexity to the missile launch sequence. In the all-weather interceptor application, the added complexity was managed by the weapons system. However, in the F-4D application, the pilot had to decide to fire the weapon 90 seconds prior to it actually leaving the aircraft, as he had to push a button to discharge the nitrogen and then fire the missile within a lapsed time of between two to three minutes after the nitrogen had been discharged! Not an easy task to complete in a 6g turning fight.'

Like Robin Olds, fellow 'Wolfpack' MiG killer Brig Gen David Williams was not a fan of the AIM-4 either;

'Pilots much preferred to employ the Sidewinder because it was more reliable, required less cockpit procedure and incorporated a proximity fuse. The AIM-4 was a hit-to-kill missile, and the pilot had to go through a "Mickey Mouse" ("hit the tit" twice) cockpit procedure to cool the missile's seeker head, uncage the gyro, then secure a "high tone" IR signal from the seeker head before he could launch the missile. As a consequence, we tended to rely more on the Sparrow because we appreciated its proximity fuse and the missile's reliability.'

FALCON FRUSTRATION

The 'Wolfpack's' first combat engagement with AIM-4D-armed Phantom IIs took place on 2 June 1967. A MiGCAP element of two Sidewinder-armed F-4Cs and a pair of F-4Ds attempted to pick MiG-17s out of a defensive 'wheel' formation of eight fighters. Two Falcons, four Sparrows and three Sidewinders were fired and none scored a hit.

A second opportunity came three days later in the air battle that gave the Pascoe and Wells team their second kill. Once again, the MiGCAP flight included a mixture of F-4Cs and Ds. Maj Gen Pascoe recalled;

'It was decided to fly the AIM-4s in positions 1 and 3 and the AIM-9s in positions 2 and 4 in each flight. That mix was intended to back up the Falcons with Sidewinders in the event that the Falcons didn't perform up to expectations. In my case, that was how it worked out. After Col Olds had either fired or "stepped through" his AIM-4s, I downed a MiG-17, hitting it with both of the AIM-9s that I fired. The result was that the AIM-4 was declared unfit for combat in engagements requiring visual acquisition – another of the many lessons learned in the South-East Asia conflict which have led to the array of devastating weapons systems available to our fighting forces today.'

The failure of the Falcon in these June 1967 missions eventually prompted changes, and in mid-January 1968 the 8th TFW MiGCAP configuration was altered through the creation of a 'Fast CAP' flight that was to deal exclusively with MiG-21s. These F-4s had AIM-9s in place of AIM-4s, a 600-gallon tank in place of the gun pod and one ECM pod.

Returning to the 5 June 1967 mission, Col Olds' first two shots from 'Chicago 01' as he broke into a MiG 'wheel' were AIM-4s, fired within textbook parameters. One missile failed to guide and the other did not leave the launch-rail! Giving up on the AIM-4s, he then released all four of his AIM-7s in boresight mode and none of them guided correctly either. Once again he was denied his fifth kill, and jet ace status.

The F-4D's first kill was made on the same day, but with an AIM-7 rather than a Falcon. The 555th TFS's Maj Everett T Raspberry and Capt Francis Gullick ('GIB') were leading a MiGCAP for *Iron Hand* aircraft when MiG-17s jumped the third and fourth Phantom IIs in their 'Drill' flight. This element became separated and departed the area, leaving 'Drill 01' and '02' to battle it out with both them and a 'wheel' of eight other MiG-17s. Several times 'Razz' Raspberry attempted to gain a firing position, but he eventually extended out for four miles, returning for an AIM-4 shot at a MiG in his '12 o'clock high' position. The weapon failed to home in, missing its target by 20 ft. The Falcon's limited agility meant that it could not adapt to increasing angle-off manoeuvres by a target aircraft, homing instead on the jet's hot exhaust plume.

Abandoning that target, 'Drill 01' pulled away from the fight once again and repositioned for a second Falcon launch. It too missed, by

555th TFS/8th TFW F-4D 66-0249 is seen here at Ubon RTAB shortly after its 5 June 1967 MiG kill by Maj Raspberry and Capt Gullick. The jet is carrying AIM-4s and has been marked with a MiG star. It also features the FY codes worn at the time of the kill (Fred McSorley)





'Raz' Raspberry's F-4D MiG killer 66-0249 remained in South-East Asia until the very end of the Vietnam War, the jet flying its last mission from Ubon on 4 August 1974. Photographed here on a bombing mission over Cambodia in the summer of 1973, the Phantom II carries an AN/ALQ-101 noise/deception jammer. Assigned to the 13th TFS/432nd TRW, its unit markings are confined to a blue fin cap (Col Ron Thurlow)

around ten feet, and a third AIM-4 failed to launch at all. After yet another charge into the melee, this time at an altitude of less than 100 ft, Gullick locked their final AIM-4 onto a target at their '11 o'clock', but it just skimmed past the MiG. Maj Raspberry then resorted to his AIM-7s, launching one at a MiG-17. However, a MiG warning from Col Olds caused him to break away without actually seeing the missile hit its intended target. Fortunately for Raspberry, his wingman Capt Douglas Cairns saw the Sparrow

guide onto the MiG, which in turn exploded when it hit the ground.

The 5 June engagements had seen 'Triple Nickel' crews attempt to fire at least six AIM-4s, and all had failed. From then until August, the 8th TFW attempted to fire a total of fifteen Falcons, of which only ten left their launch rails and none scored a hit. Col Olds' furious response was to ask Seventh Air Force to remove the missiles from the base and re-wire his F-4Ds for Sidewinders. As MiG killer Gen Don Logeman recalled to the author, 'Col Olds had very little use for (or anything good to say about) the AIM-4, and his disdain for it was well known throughout the theatre. Most of his troops lined up four-square behind him on that issue'.

After Col Olds departure from Ubon in September 1967, the Falcon remained in use with the 'Wolfpack'. Brig Gen Williams recalled that Seventh Air Force told the wing to cease and desist from the field modifications to the inboard weapons pylons to accommodate AIM-9s which Col Olds had authorised his armament crews to implement. It had been a popular move with his troops. As Bill Gordon told it;

'We recognised the AIM-4's severe limitations during our training, and we were all delighted when Col Olds ordered the F-4Ds to be retro-fitted with AIM-9 capability. The AIM-4 was so limited that it was way inferior to the AIM-9. I think it was doomed when they designed it as a "must hit the target" missile with a small warhead.'

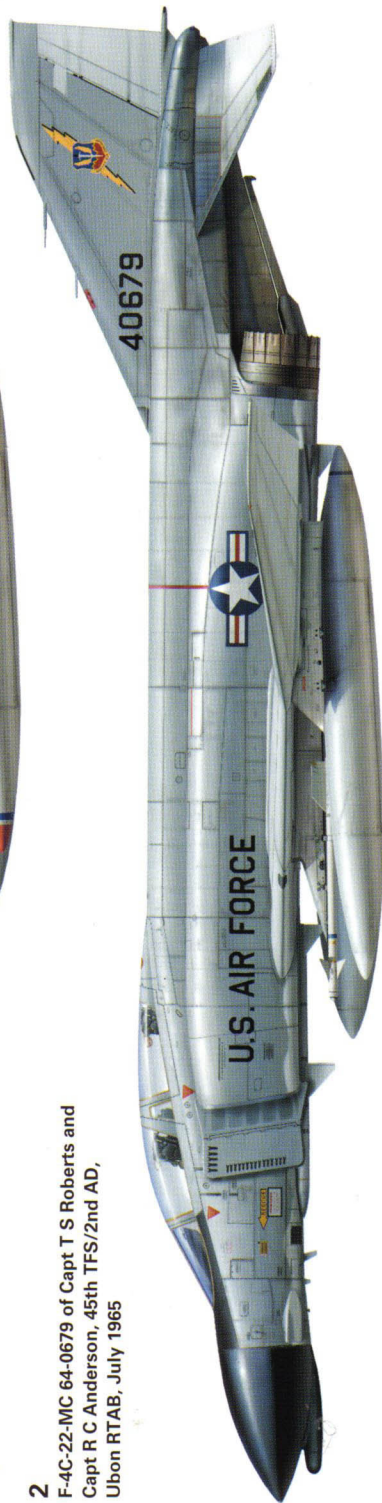
Unfortunately, these problems occurred at a time when the 8th TFW was in need of a better missile to counter the increasing threat posed by the MiG-21. Using new tactics, the MiGs would approach at low altitude and then climb to attack the strike formations with their 'Atoll' missiles, after which they would dash to safety before they could be intercepted by the MiGCAP F-4s. One such attack, on 23 August 1967, saw the 555th TFS lose four F-4Ds, with a fifth enjoying a lucky escape. Two 'Ford' flight F-4Ds were shot down by 'Atoll' missiles (one fired from the MiG-21 of leading 'Fishbed' ace Nguyen Van Coc) over the target, a third took an AAA hit, running out of fuel before it could reach a tanker and one other was also destroyed by flak. The fifth F-4D narrowly escaped an AIM-7 fired at it in error by an F-4C, the crew of the latter jet realising their error in time to break the missile's radar lock.

The two losses to MiGs were partly caused by revised MiG-21 tactics. Instead of slashing attacks from above, the two (*text continues on page 65*)

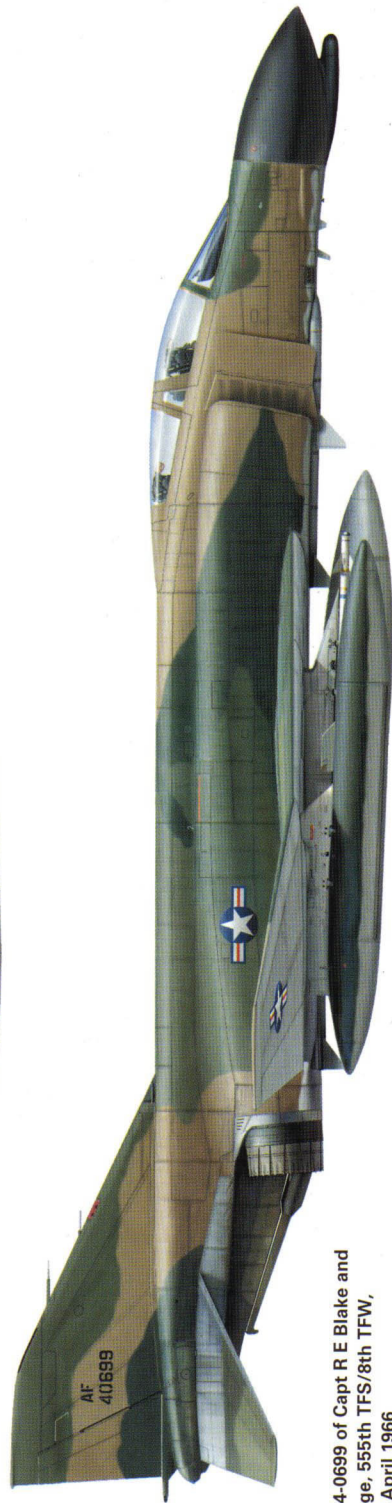
COLOUR PLATES



1 F-4C-22-MC 64-0693 of Capt K E Holcombe and Capt A C Clarke, 45th TFS/2nd AD, Ubon RTAB, July 1966

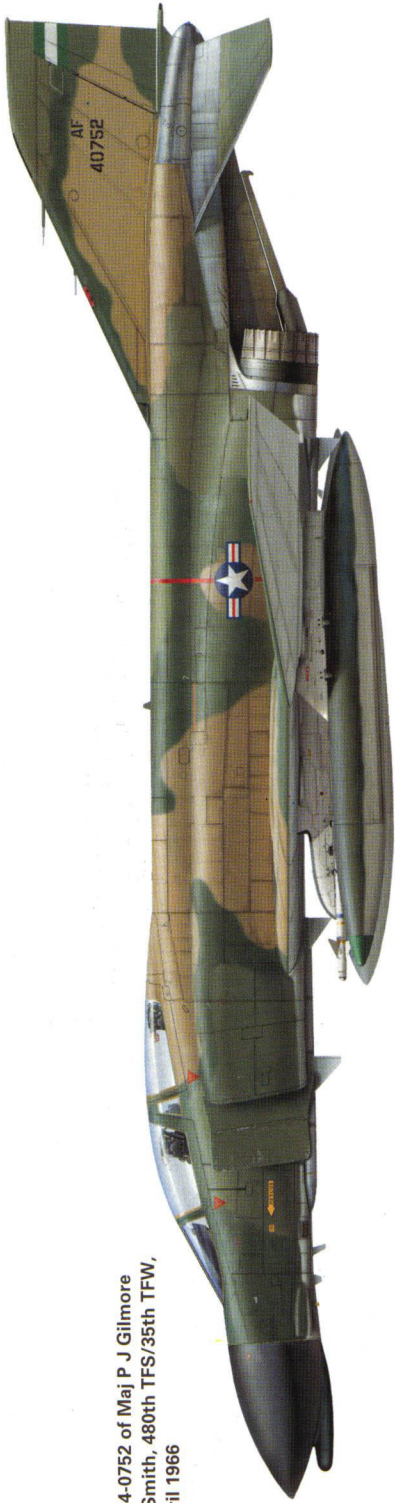


2 F-4C-22-MC 64-0679 of Capt T S Roberts and Capt R C Anderson, 45th TFS/2nd AD, Ubon RTAB, July 1966



3 F-4C-22-MC 64-0699 of Capt R E Blake and 1Lt S W George, 555th TFS/8th TFW, Udorn RTAB, April 1966

4
F-4C-23-MC 64-0752 of Maj P J Gilmore
and 1Lt W T Smith, 480th TFS/35th TFW,
Da Nang, April 1966

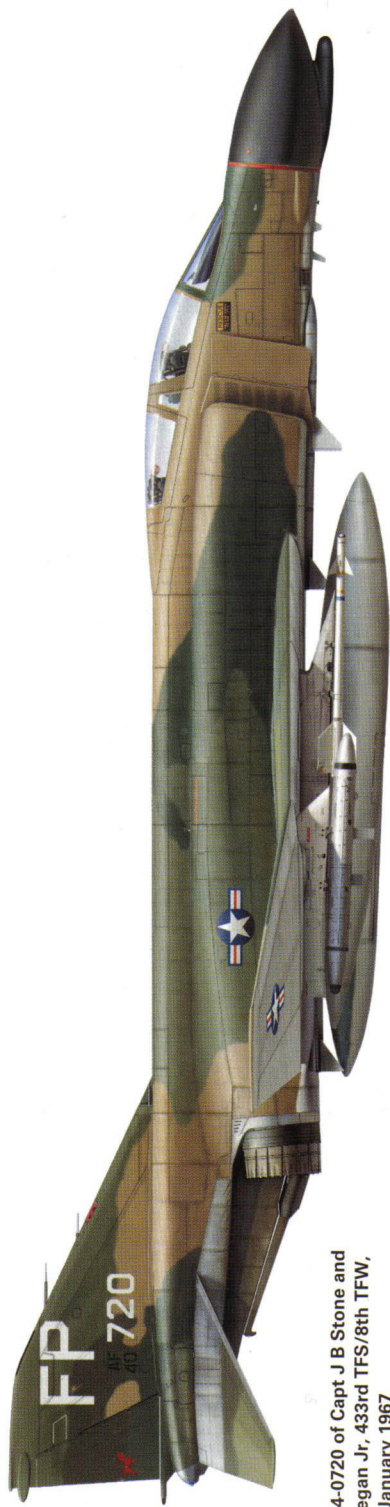


5
F-4C-18-MC 63-7489 of Capt W J Swendner
and 1Lt D A Burtell Jr, 480th TFS/35th TFW,
Da Nang, July 1966



6
F-4C-24-MC 64-0838 of Maj P P Combies
and 1Lt L R Dutton, 433rd TFS/8th TFW,
Ubon RTAB, January 1967

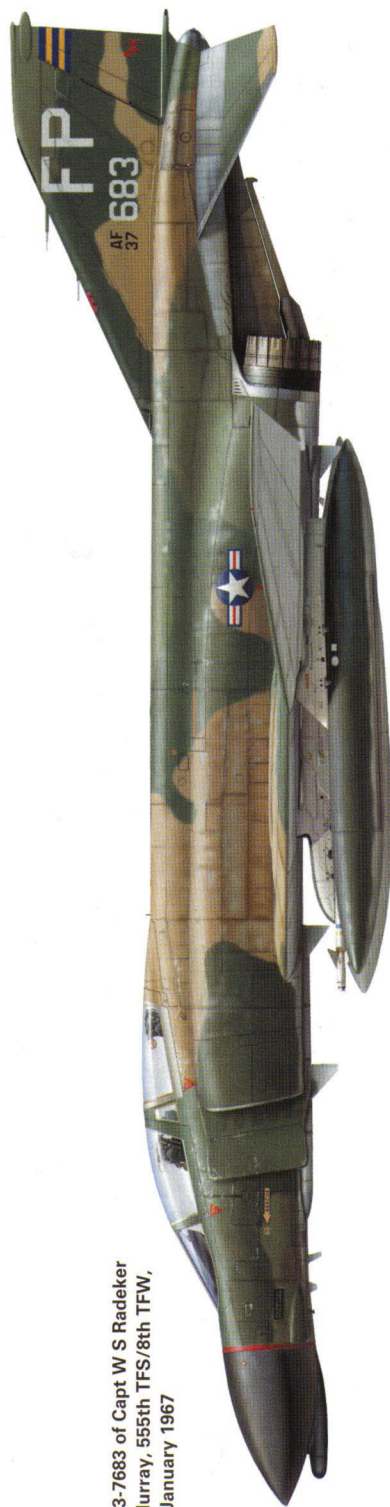




7 F-4C-22-MC 64-0720 of Capt J B Stone and 1Lt C P Dunnegan Jr, 433rd TFS/8th TFW, Ubon RTAB, January 1967

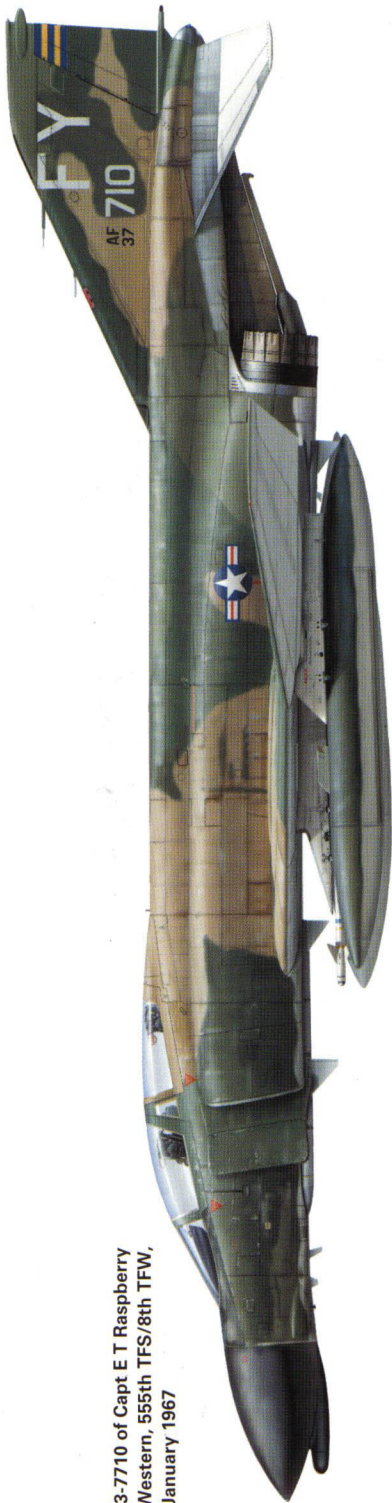


8 F-4C-21-MC 63-7680 of Col R Olds and 1Lt C Clifton, 555th TFS/8th TFW, Ubon RTAB, January 1967

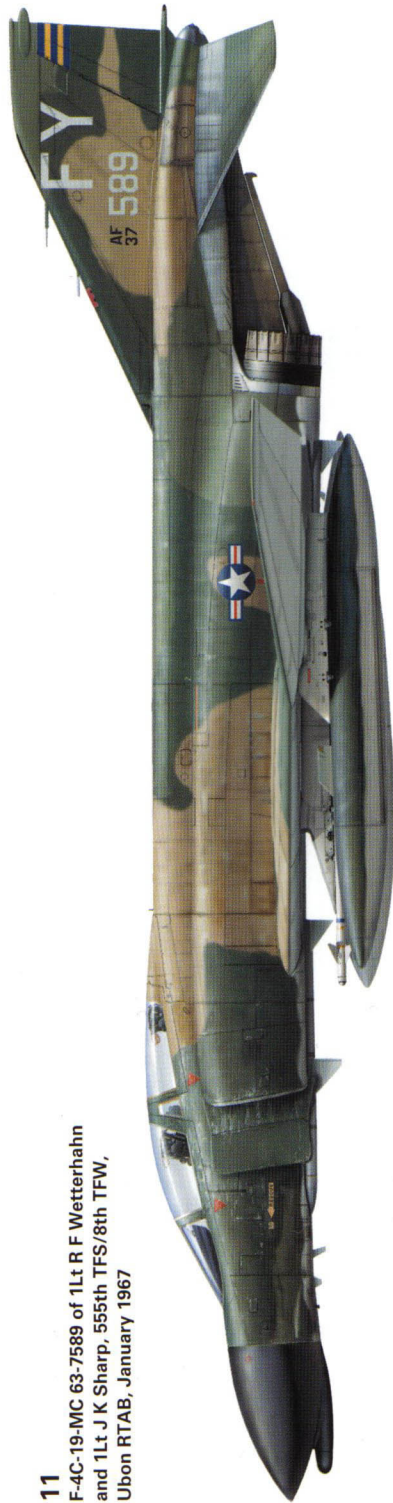


9 F-4C-21-MC 63-7683 of Capt W S Radeker and 1Lt J E Murray, 555th TFS/8th TFW, Ubon RTAB, January 1967

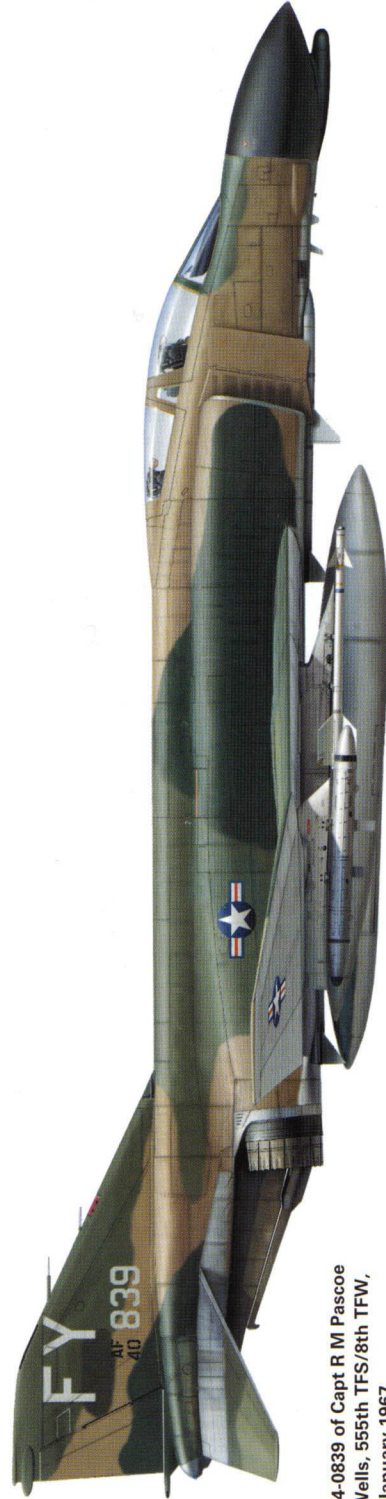
10
 F-4C-21-MC 63-7710 of Capt E T Raspberry
 and 1Lt R W Western, 555th TFS/8th TFW,
 Ubon RTAB, January 1967



11
 F-4C-19-MC 63-7589 of 1Lt R F Wetterhahn
 and 1Lt J K Sharp, 555th TFS/8th TFW,
 Ubon RTAB, January 1967



12
 F-4C-24-MC 64-0839 of Capt R M Pascoe
 and 1Lt N E Wells, 555th TFS/8th TFW,
 Ubon RTAB, January 1967

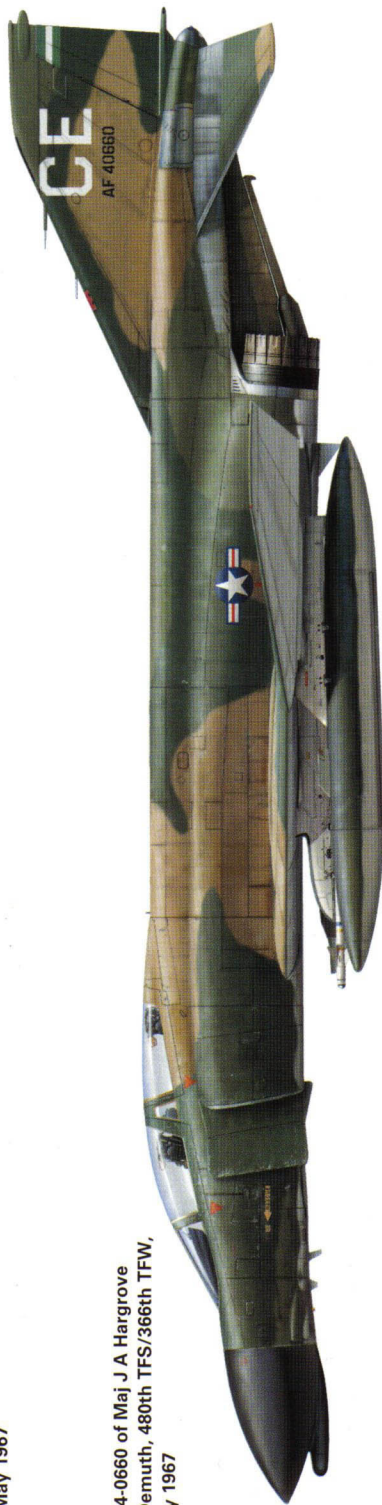




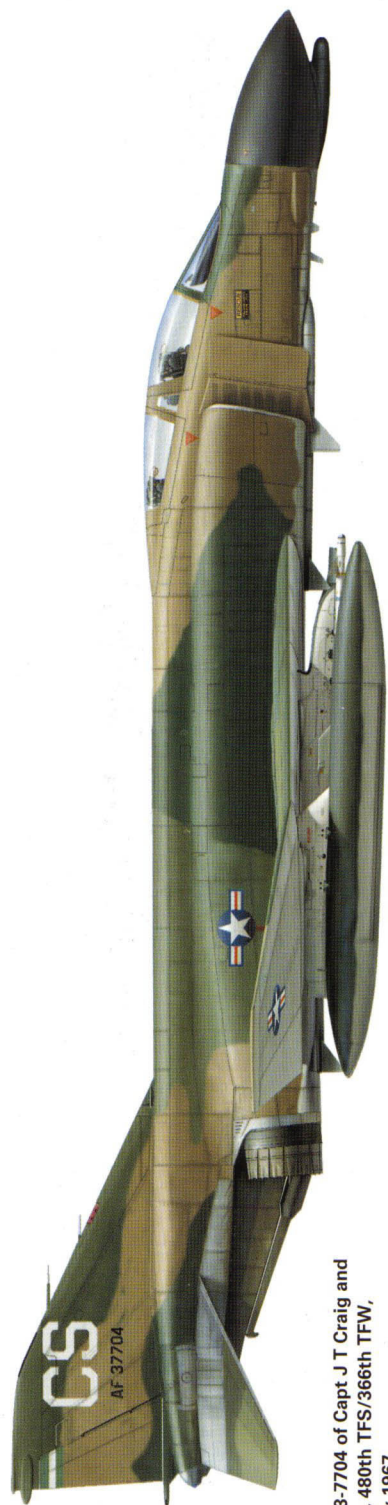
13 F-4C-24-MC 64-0849 of Maj T M Hirsch and 1Lt R J Strasswimmer, 555th TFS/8th TFW, Ubon RTAB, January 1967



14 F-4C-21-MC 63-7668 of Col R Olds and 1Lt W D Lavefer, 555th TFS/8th TFW, Ubon RTAB, May 1967



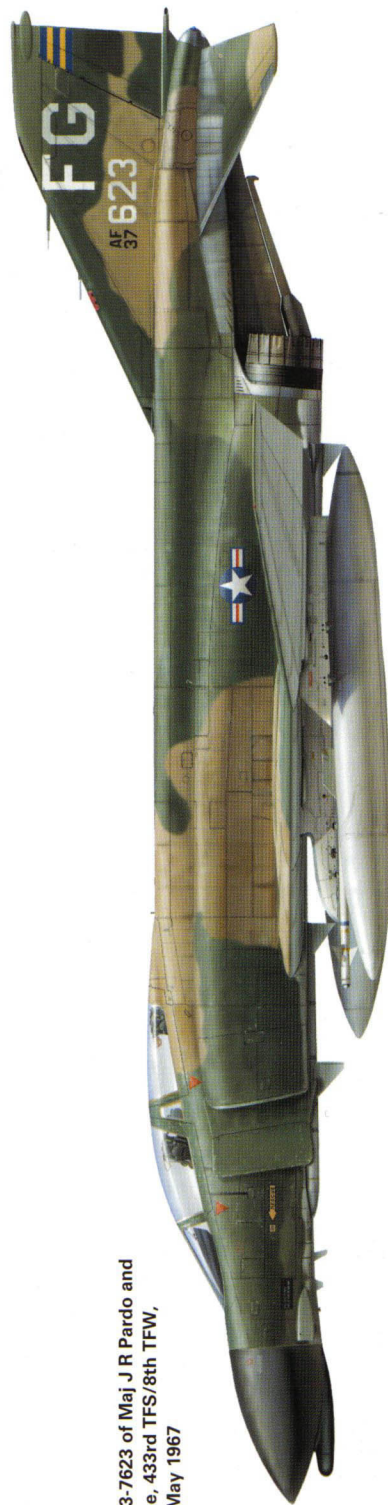
15 F-4C-21-MC 64-0660 of Maj J A Hargrove and 1Lt S H Demuth, 480th TFS/366th TFW, Da Nang, May 1967



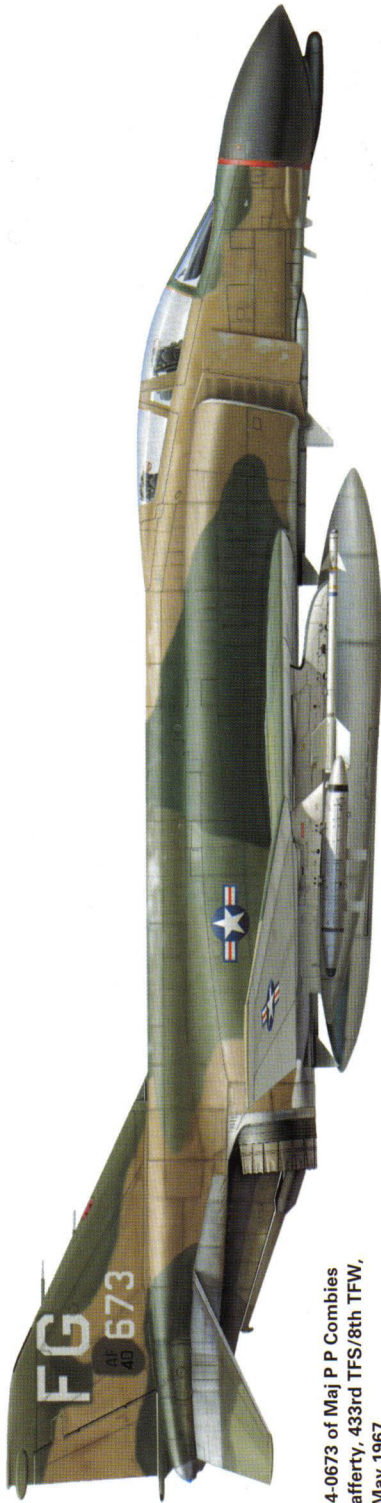
16 F-4C-21-MC 63-7704 of Capt J T Craig and 1Lt J T Talley, 480th TFS/366th TFW, Da Nang, May 1967



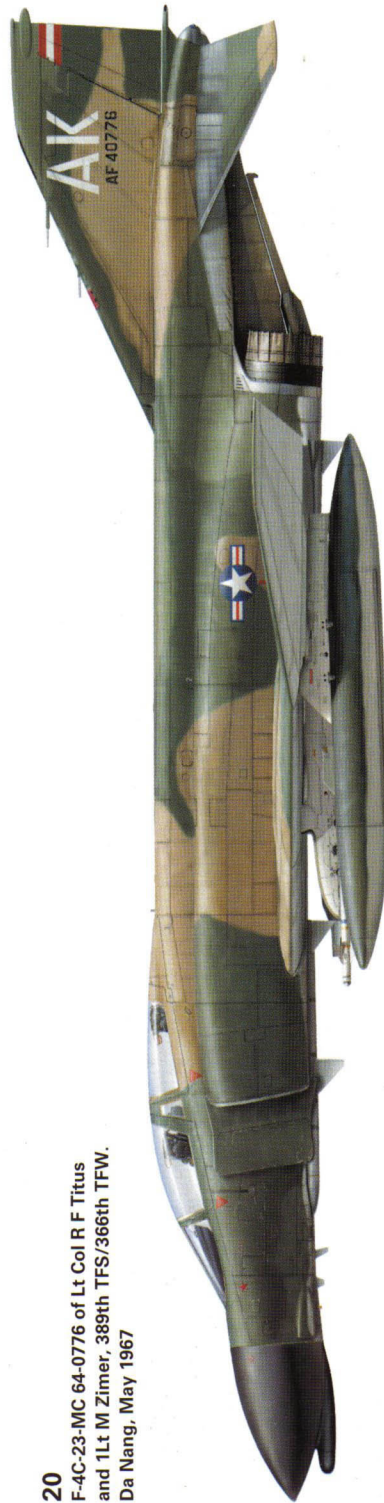
17 F-4C-24-MC 64-0829 of Col R Olds and 1Lt S B Croker, 433rd TFS/8th TFW, Ubon RTAB, May 1967



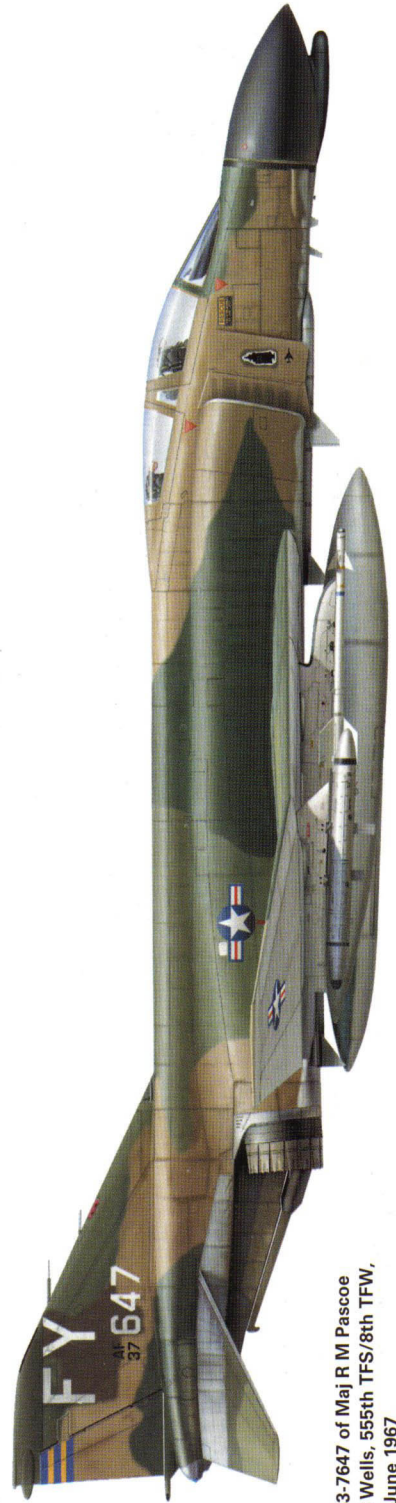
18 F-4C-20-MC 63-7623 of Maj J R Pardo and 1Lt S A Wayne, 433rd TFS/8th TFW, Ubon RTAB, May 1967



19
F-4C-22-MC 64-0673 of Maj P P Combies
and 1Lt D L Lafferty, 433rd TFS/8th TFW,
Ubon RTAB, May 1967



20
F-4C-23-MC 64-0776 of Lt Col R F Titus
and 1Lt M Zimer, 389th TFS/366th TFW,
Da Nang, May 1967



21
F-4C-20-MC 63-7647 of Maj R M Pascoe
and Capt N E Wells, 555th TFS/8th TFW,
Ubon RTAB, June 1967

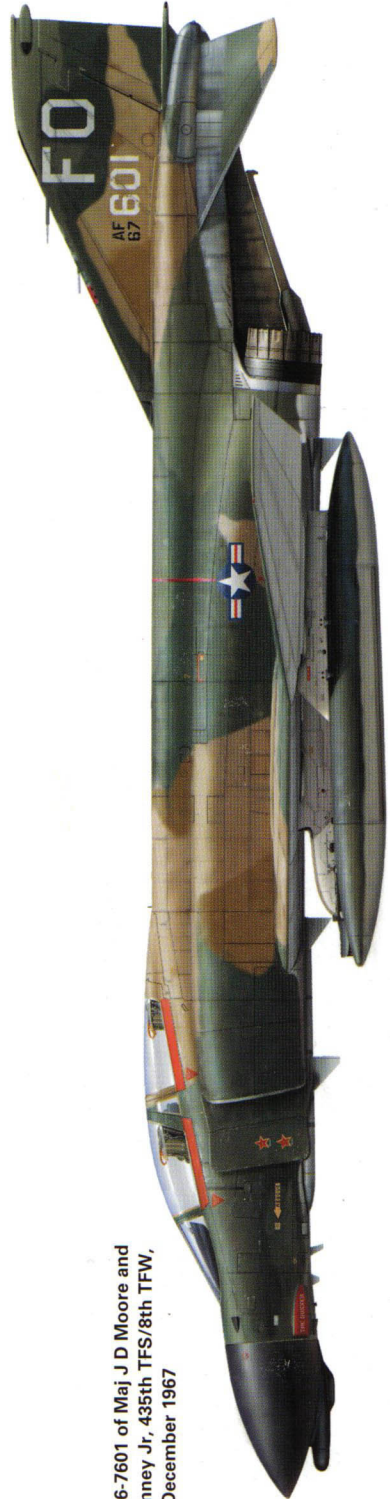
22 F-4D-29-MC 66-0249 of Maj E T Raspberry and Capt F M Gullick, 555th TFS/8th TFW, Ubon RTAB, June 1967

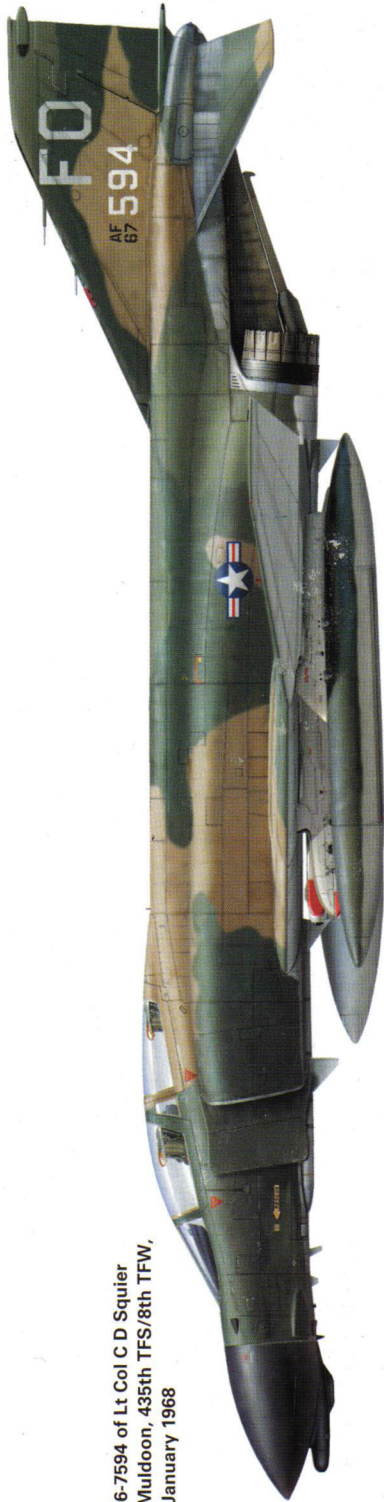


23 F-4D-32-MC 66-8719 of Capt D D Baker USMC and 1Lt J D Ryan Jr, 13th TFS/432nd TRW, Udorn RTAB, December 1967

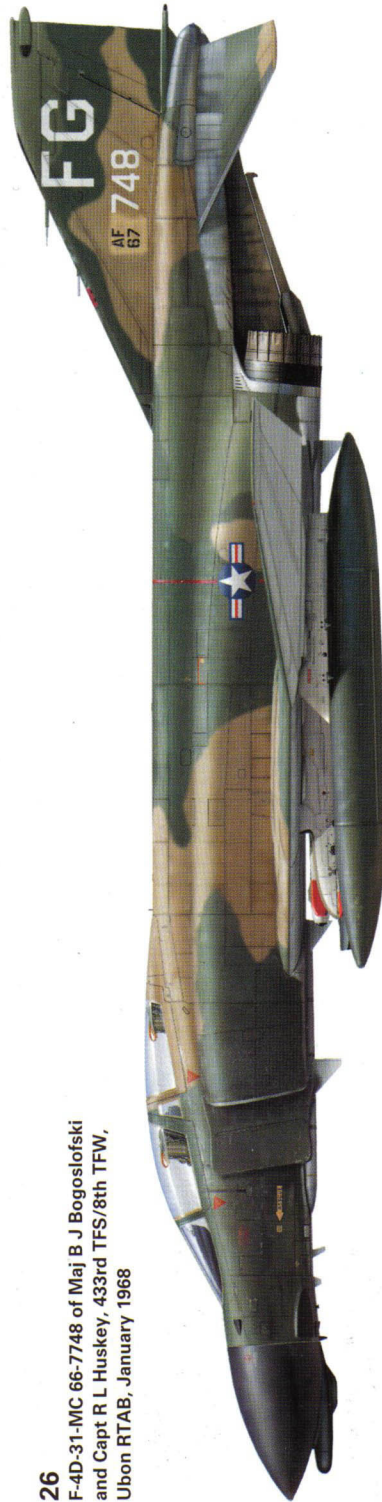


24 F-4D-30-MC 66-7601 of Maj J D Moore and 1Lt G H McKinney Jr, 435th TFS/8th TFW, Ubon RTAB, December 1967





25 F-4D-30 MC 66-7594 of Lt Col C D Squier and 1Lt M D Muldoon, 435th TFS/8th TFW, Ubon RTAB, January 1968



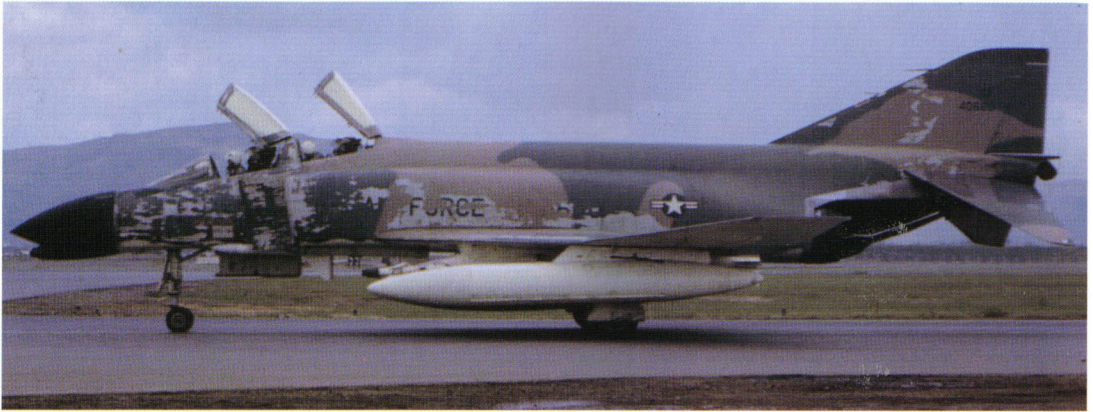
26 F-4D-31-MC 66-7748 of Maj B J Bogoslofski and Capt R L Huskey, 433rd TFS/8th TFW, Ubon RTAB, January 1968



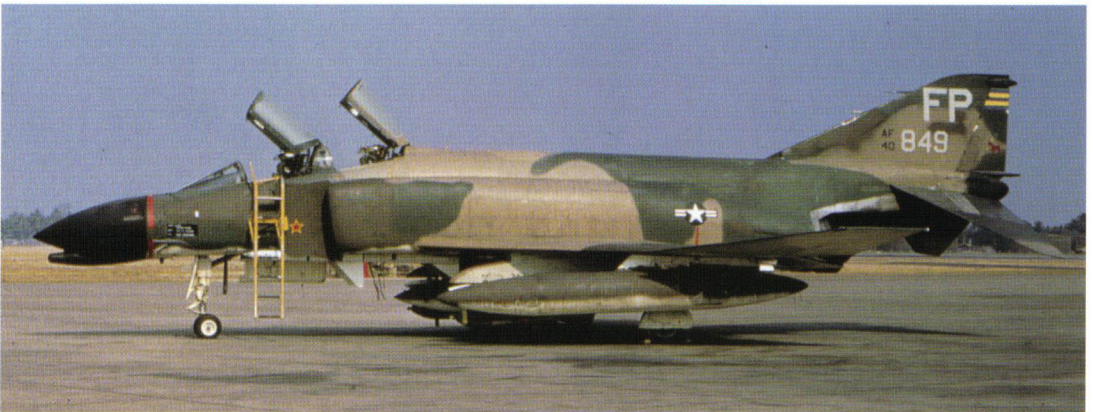
27 F-4D-31-MC 66-8688 of Capt R H Boles and 1Lt R B Battista, 433rd TFS/8th TFW, Ubon RTAB, February 1968



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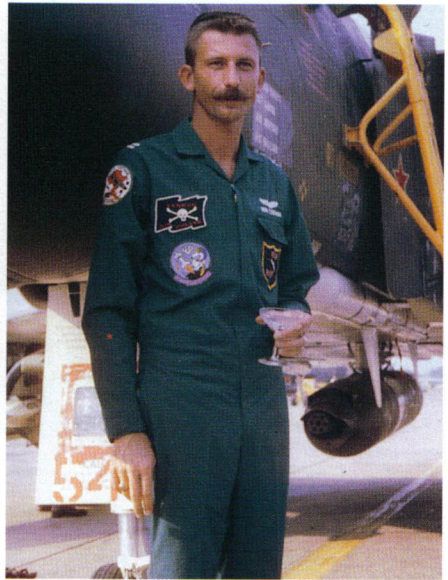
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921st FR pilots worked their way to the back of the strike force at low altitude, zoom-climbed to make a single attacking pass from 28,000 ft and then chanelled away above cloud, unseen by the F-4s' forward-sweeping radar scanners. The MiGCAPs' first warning of the attack came when 'Ford 04' exploded after an 'Atoll' hit, closely followed by a second F-4 fireball. Van Coc's jet was the only VPAF aircraft damaged in the clash, the ace inadvertently flying into cannon shells fired from his leader's MiG-21 while he was shooting down the F-4D (66-0238) of Maj Charles Tyler and Capt Ron Sittner with an 'Atoll'.

The new tactics came as an unpleasant surprise to the Ubon flyers, although they had apparently been anticipated by the Pentagon. Brig Gen Olds recalls;

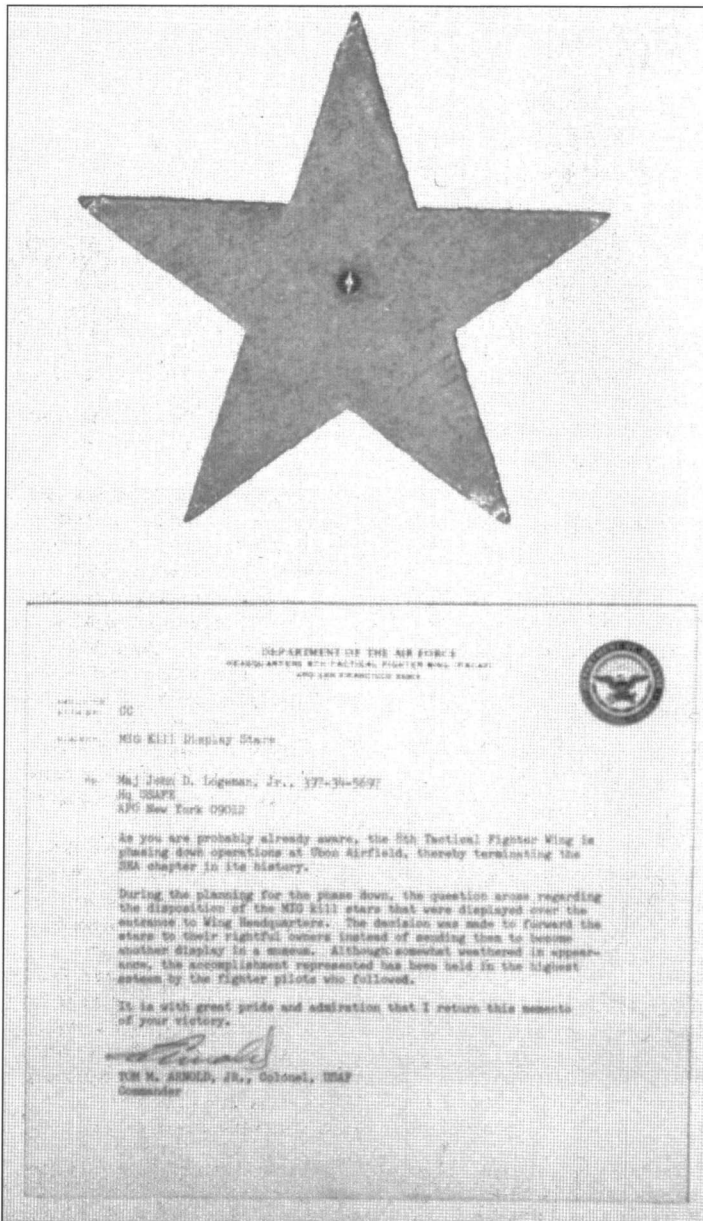
'The Intelligence people were constrained by their erudite peers in the nether regions of the Pentagon. It was feared that giving immediate intelligence to the fighting troops would jeopardise the fact that our people had some kind of clue as to what was happening. Of course both the North Vietnamese and the Russians knew we had information relating to the VPAF's impending change in tactics, but our crews in the frontline were not to be trusted with such intelligence. As a consequence, on 23 August we were struck by a supersonic attack from our "deep six" just as we turned down "Thud Ridge". We lost two F-4s there, and another over the target. Needless to say, I was furious when I found out that the "spooks" in Saigon knew that the North Vietnamese had practised for over a week to get in position to do what they did – and they couldn't warn me.'

Some serious work was undertaken to improve coordination with the EC-121s and other intelligence sources following this disastrous mission. MiG killer Maj Bill Kirk, as 8th TFW Chief of Tactics, was heavily involved in this. One of the main outcomes was that permission was finally given to attack Phuc Yen airfield, on 24 October, and it was fitting that the day's kill should go to Bill Kirk and his 'GIB', 1Lt Ted Bongartz.

The Falcon's first successes were scored by 555th TFS Capts Larry D Cobb and Alan A Lavoy ('GIB') on 26 October 1967. 'Ford' flight's

F-4D 66-7565 was the mount of Capts Larry Cobb and Alan Lavoy when they destroyed a MiG-17 with an AIM-4D Falcon on 26 October 1967 (Don Jay via Peter Schinkelshoek)





When the 'Wolfpack' closed down operations at Ubon in September 1974 and moved to Kunsan AB, in South Korea, to replace the 3rd TFW, the 8th TFW's boss, Col Tom Arnold, took down the wooden MiG kill stars that had been nailed on the front entrance of the Wing HQ. He then had them returned to the aircraft commanders responsible for the kills. Don Logeman's trophy is seen here with Col Arnold's explanatory letter

F-4Ds were escorting two RF-4Cs ('Random 01' and '02') at 0850Z when they were bounced by six MiG-17s (four silver and two camouflaged jets) near Phuc Yen airfield. By the end of the fight three of the F-4D crews had shot down a MiG each, although 'Ford 04' (Cobb and Lavoy) scored the only Falcon victory.

Flight leader Capt John D Logeman Jr, with 'GIB' 1Lt Frederick E McCoy II, first noticed the MiGs climbing through a cloud layer to meet the Phantom II flight. On this occasion 'Ford 02' and '04' were armed with AIM-4s, while the remaining two jets carried Sidewinders. As Don Logeman pointed out, this was usually wing practice rather than policy, as were AIM-7 firing techniques. 'Weapons and Tactics officers (as well as Col Olds) favoured ripple-firing AIM-7Es to gain the increase in probability of kill (Pk) which two missiles provided.'

As the MiGs approached, 'Ford 03' and '04' turned into them while Don Logeman told the two RF-4Cs to exit fast. He too then turned with his wingman towards the MiGs. Aircraft '03' and '04' flew through the VPAF jets and then pulled around to re-engage, while 'Ford 01' released two AIM-7Es, although only the second guided properly. A stream of 'flaming golf ball' cannon shells from the MiGs forced Logeman and 'Ford 02', crewed by

Maj John A Hall and 'GIB' 1Lt Albert Hamilton (whose radio had failed), to pull up into a steep right turn.

During the course of this manoeuvre Hall and Hamilton noticed that one of the two MiGs beneath them was inverted and spiralling down, trailing sparks. The other MiG dived away into clouds as three of the 'Ford' crews spotted a white parachute from the stricken MiG-17 drifting down about four miles from Phuc Yen.

Observing another of the MiGs turning away in their 'ten o'clock' position at a distance of about two miles, Fred McCoy locked on and fired an AIM-7E at it. Although the Sparrow appeared to be on track, Capt Logeman had to break radar lock when his F-4D was bracketed by a stream of cannon fire from yet another MiG-17. He was then obliged to depart the



battle with low fuel, and it is presumed that his missile did not reach its target lock – the VPAF records only three losses on that day.

Meanwhile, Capt Bill Gordon and ‘GIB’ 1Lt James H Monsees in ‘Ford 03’ had moved out to gain separation from the enemy jets, and on re-engagement found themselves closing head-on with a pair of MiGs. Gordon recalled;

‘1Lt Monsees was not my regular back-seater. He was filling in for Paul Schowalter, who was home on his mid-term leave. Monsees did great. He got a head-on, full systems lock-on for my Sparrow launch.’

At 2.5 miles he attempted to ripple-fire two AIM-7Es. Only one came out of its launch bay, and Gordon was unable to observe its progress because his attention was focused on avoiding a stream of fiery shells from the oncoming MiG-17s. Worse still, ‘Ford 04’s’ crew noticed another MiG-17 firing ‘Atolls’ in their direction, and saw the top-side of the fighter as it flashed past them. Luckily, the AAMs passed below the F-4.

Turning back into the fight, Gordon (and Cobb in ‘04’) saw another parachute at around 16,000 ft in the vicinity of his missile’s likely impact on the MiG. Capt Gordon then swung F-4D 66-7546 around for two more attack runs at the VPAF fighters, which had been joined by an additional pair of MiG-17s. On his second run he got into a good ‘six o’clock’ position behind one of them and selected an AIM-4D missile, cooled it, listened for the tone and fired it in self-track mode. By this time the MiG had turned for a head-on gun attack as the Falcon left its launcher with a full systems lock-on at a range of 6000 ft. A warning from ‘Ford 04’ of another MiG closing to attack then forced Gordon to break away.

Although the AIM-4 seemed to be on target, he was unable to follow its flight. James Monsees saw a second parachute about 10,000 ft below the white ‘chute from the first kill, but this potential victory could not be confirmed. In retrospect, Bill Gordon was convinced that he could have got that second MiG if he had been using an AIM-9 instead. ‘I got behind my second

F-4D 66-7546/OY has been bombed up with a mix of CBU, Mk 82 and ‘daisy cutter’ ordnance. On 26 October 1967 (in FY codes), this aircraft was one of the two MiG killers involved in the ‘Run for the Roses’ – a successful ruse that trapped MiG-21s using a simulated photo-reconnaissance overflight. The jet survived in 432nd TRW service until it was lost to 37 mm AAA whilst conducting a FAC mission in northern Laos on 1 October 1969. OY codes were used by the 555th TFS from 1 June 1968 (Don Jay via Peter Schinkelshoek)

Dubbed *MR LUCKY*, F-4D 66-7546 was flown by Capt Gordon and 1Lt Monsees for their ‘Run for the Roses’ MiG kill on 26 October, although the nickname was probably applied a little later. The circular patch behind that name suggests previous artwork. Fellow ‘Run for the Roses’ MiG killer Don Logeman is seen de-planing at the end of his combat tour (*Maj Gen Don Logeman*)



MiG in a great position for an AIM-9 shot. By the time I recognised a good shot, selected the AIM-4 switches on the instrument panel, cooled the missile, got the tone and tried to acquire a lock, the MiG had turned almost 180 degrees and was firing at me head-on.'

If anyone could have scored with an AIM-4 it had to be Bill Gordon;

'I was the 40th TFS AIM-4 project officer at Eglin AFB, where Capt Mike Loh was the 333rd TFW AIM-4D project officer. I trained the squadron with a classroom slide briefing, then we flew with training missiles that we cooled and practiced locking on to explore the kill envelope, followed by a live missile firing at a drone. When the 40th TFS deployed to Ubon with the first AIM-4-capable F-4Ds and became the 555th TFS, I gave the other 8th TFW squadrons a slide briefing. There was no other practice, hence some of the problems with the first combat sorties using the missile. The pilots were not very well trained.'

Meanwhile, Capts L D Cobb and A A Lavoy ('GIB') in 'Ford 04', who had stuck to Capt Gordon's wing throughout the attack runs, managed to get into position behind another MiG-17. The crew prepared an AIM-4D for a self-track launch at a ten- to fifteen-degree angle, and the 'OPREP-4' debrief report on the subsequent engagement stated that, "Ford 04" pulled lead, fired optically and watched the missile guide to the tail of the MiG, where it detonated, pitching it 90 degrees right. The MiG pilot immediately baled out. The aircraft spiralled uncontrolled into clouds at approximately 2114/10559'. Five months after its combat debut, the AIM-4 had scored its first kill.

Capt Gordon would fall to a MiG-21 on 8 November that year when an 'Atoll' sheared off the tail of his F-4D (66-0250).

'RUNNING FOR THE ROSES'

The 26 October 'recce escort' mission which had seen the AIM-4 at last register its first kill had actually been performed for a reason other than straight photo-reconnaissance, as Don Logeman explained;

'We escorted the two RF-4Cs on a high-speed run from a point north-west of Yen Bai along a straight line to Phuc Yen airfield, where the RF-4Cs would simulate a photo shot. The real mission was to calibrate this type of profile for later *Combat Sky Spot* and radar bombing missions. Those recce runs over North Vietnam were fondly (and sometimes profanely) referred to as "The Run for the Roses", and were almost guaranteed to produce copious SAM firings, specially on days like 26 October, when we were flying above an overcast sky.

'After these somewhat unexpected MiG engagements, and the three victories, we later wired a bouquet of three roses to Brig Gen Robin Olds – who by then had taken up his new posting as Commandant of Cadets at the US Air Force Academy – with our best regards and thanks for his stellar training and leadership at Ubon. We later heard that during lunch one day he had the roses on his table at the elevated dais in the Academy mess, and he called the attention of the entire cadet corps to the three roses so that he could explain what they signified. That has always seemed to me like a "Robin Olds" kind of thing to do.'

Don Logeman's experience of the AIM-4 was similar to Bill Gordon's;

'I had the opportunity to engage MiGs on four other occasions. I experienced unsuccessful launches of the AIM-7E on three occasions



'Triple Nickel' crews pose with the squadron flag soon after returning to Ubon RTAB following their triple MiG-killing 'Run for the Roses' haul on 26 October 1967. They are, back row (left to right), Capt J D Logeman, 1Lts F E McCoy and J H Monsees, Capts W S Gordon and A A Lavoy and 1Lt A T Hamilton, and front row (left to right), Maj J A Hall and Capt L D Cobb. Commenting on the proliferation of facial hair amongst these pilots, Don Logeman explained that 'many of Col Olds' faithful warriors tried, with varying degrees of success, to replicate his bodacious handlebar moustache' (Maj Gen J D Logeman)

and an AIM-4 on another. During the latter, I quite suddenly, and unexpectedly, found myself about 1.5 miles behind a MiG-17. He came out of nowhere, turning in front of me and obviously didn't notice me at first. But by the time I had dealt with the various AIM-4 aiming, cooling, tracking and firing switchology and button pushing, the MiG saw me, performed the tightest 180-degree turn I ever saw, before or since, and passed the AIM-4 and me head-to-head!

'On each of the five missions in which I engaged enemy aircraft I did not have a gun pod, and it

would have been a definite advantage on at least two occasions. However, it meant severe penalties in drag, manoeuvrability and fuel consumption. We specifically didn't carry the gun on 26 October because we would not have been able to match the RF-4Cs' intended ingress speed (in excess of 500 knots, and I for one do not blame them!), nor would we have had sufficient fuel to get to the target and back.

'The F-4's 600-gallon centreline tank was normally only carried on the longest missions, or certain sorties that included some eccentric combination of weapons and/or an ECM pod that precluded us from carrying both external wing tanks. In those situations we would load the centreline "tub" and one outboard wing tank. The centreline tank would be emptied first (after en route air refuelling) and routinely jettisoned as soon as it was empty to avoid the drag penalty and manoeuvring limitations that it would otherwise bring to the fight. It limited the F-4 to a maximum of 3g – not too beneficial in a combat situation!'

EYES IN THE SKY

All four October 1967 MiG kills were assisted by the more effective use of the QRC-248 IFF transponder interrogator that had been installed in *College Eye* EC-121Ds from May of that same year onwards. This device could read the SRO-2 IFF transponder installed in VPAF MiGs, enabling EC-121D crews to tell which of the radar blips over the North were hostile, particularly at low altitudes. North Vietnamese GCI relied on the SRO-2 when directing their fighters towards strike packages.

Initially, *College Eye* operators were forbidden to interrogate the transponders actively in case the QRC-248's capability was accidentally revealed, so they had to wait for ground-based North Vietnamese GCI controllers to do this for them and then calculate the MiGs' positions passively. Nevertheless, the device was still extremely valuable for it revealed the MiGs' mission procedures and gave valid, specific MiG warnings to US aircraft over the North.

From 6 October the improved *Rivet Top* and *College Eye* EC-121 crews were allowed to interrogate actively, giving strike force crews much better information about the location of MiG threats so that they could



F-4D 66-8719 was Marine Corps Capt Doyle Baker's MiG killer on 17 December 1967. His back-seater on the mission, 1Lt Jack Ryan, was the eldest son of PACAF commander (later Chief of Staff) Gen John D Ryan, and he was killed in a flying accident two years later. Gen Ryan later facilitated Capt Baker's transfer from the Marines to the Air Force after the former tried to send him on a third combat tour and refused to let him leave the 'Corps (Col Doyle Baker via Peter B Mersky)



be positioned to meet high-speed interceptions under far more favourable conditions. Despite this, the MiG-21 force achieved a 3-to-2 success ratio during October, and maintained this advantage throughout November thanks to the grounding of the EC-121 *Rivet Tops* for vital modification work.

By then some MiG-21 pilots had already sensed that they were being

monitored, and they would routinely switch off their transponders. Little intelligence pertaining to this new technology was imparted to the F-4 units, however, as Don Logeman explained;

'Most aircrew at Ubon had at least a nodding acquaintance with the *Rivet Top* capabilities, but the in-depth understanding and tactical/strategic significance and application of it was all pretty much the property of the senior leaders and weapons/tactics guys.'

Logeman recalled another factor that assisted their 26 October duel;

'Our adversary MiG-17s came up to engage us well above their optimum manoeuvring altitude. We were taught that, whenever possible, we should engage the MiG-17 at as high an altitude as you could get him and the MiG-21 as low as you could get him in order to capitalise on their manoeuvring disadvantages relative to the F-4 in those operating regimes. The best turn rate (corner velocity) in the F-4 was about 380 knots.'

CORPS KILL

On 17 December the much-maligned AIM-4 achieved its second kill, this victory being the first for the 432nd Tactical Reconnaissance Wing (TRW). The latter had broadened its capabilities with the arrival of the F-4D-equipped 13th TFS at Udorn in October 1967. Uniquely, the wing's opening victory fell to US Marine Corps exchange officer Capt Doyle Baker (who had flown F-4Bs in-country with VMFA-513 in 1965) and 'GIB' 1Lt John D Ryan.

Their F-4D (66-8719) was 'Gambit 03' in a MiGCAP flight escorting a substantial F-105/F-4 attack on three Route Package VI targets. In a break from routine procedure, the mission leader had declared prior to take-off that any flight member who spotted a MiG would be allowed by his flight lead to attack it.

Baker saw a low-flying, Gia Lam-based MiG-17 approaching from below, and he turned through 270 degrees before making a diving attack on it. Initially firing short bursts from his SUU-23/A gun pod, he then climbed back up to 10,000 ft in order to reposition himself for a second crack at the MiG. Baker made three more gun passes at it without success before eventually running out of 20 mm shells.

The VPAF pilot levelled out at 2000 ft and seemed to be making a dash for home. Baker set up an AIM-4 launch from two miles astern in a ten-degree dive. His description of what happened next is as follows;

'I ignited the afterburners and rolled the aeroplane, increasing speed to keep the MiG in sight. The forces of acceleration were so great that I could hardly see anything. Finally, at 500 ft and 600 knots I fired.



13th TFS F-4Ds pause at the KC-135A 'gas station' en route to a target (Peter B Mersky Collection)

F-4D 66-8709, often incorrectly identified as Doyle Baker's MiG killer, releases 500-lb LDGP bombs. 13th TFS F-4Ds carried crew names in a light blue panel on the intakes, with groundcrew names similarly applied on the opposite flank. The 13th TFS was attached to the 432nd TRW at Udorn RTAB from 21 October 1967, re-coding to UD in August 1973. The squadron scored two MiG kills during the *Rolling Thunder* years and eight in 1972 (Col Doyle Baker via Peter B Mersky)

The Falcon worked perfectly, going directly up the MiG-17's tailpipe and exploding.'

In that engagement the VPAF fighter force had overwhelmed a two-pronged US attack with up to 20 MiGs. The MiG-17s had timed their attacks on the MiGCAP F-4s to coincide with a series of thrusts made by MiG-21s against the bombers, resulting in the loss of both a 388th TFW F-105D and an 8th TFW F-4D (66-7774, piloted by Maj Kenneth Fleenor, who was one of the first USAF pilots to convert onto the F-4).

The remaining three AIM-4 successes came in the early weeks of 1968, and the first was scored by a 'Wolfpack' crew on 3 January. A considerable F-4D/F-105 strike force was targeted on railyards and bridges in the Hanoi area, and despite some MiG-21 action on the way in, there were no losses. MiG-17s then harassed the strike elements of 'Bravo' force as they egressed, and one of the strike F-4Ds, crewed by Lt Col Clayton Squier and 'GIB' 1Lt Michael Muldoon of the 435th TFS, engaged four MiG-17s head on.

Far Left

Marine exchange pilot Capt Doyle Baker with his CBU-loaded F-4D. Included in his own combat equipment is a side-arm in a black holster and flight pad references in a leg-pocket. Also note his traditional fighter pilot moustache! Baker was one of only three Marines to score a MiG kill in Vietnam, where he flew 242 missions during two combat tours. Since retiring from the USAF with the rank of colonel he has flown corporate jets (Col Doyle Baker via Peter B Mersky)



The 435th FS's Lt Col Clayton Squier and 1Lt Mike Muldoon used this F-4D (66-7594) to claim their MiG-17 with an AIM-4D on 3 January 1968. The jet later flew with the 388th TFW (JJ) and the 49th TFW (HO), before being written off in 474th TFW service on 28 August 1979 (Norm Taylor via Alan Howarth)

An unusual formation of 433rd TFS F-4Ds, all carrying AIM-4D missiles and SUU-23/A gun pods, on 1 November 1967. Two months later the nearest aircraft, 66-7748, shot down a MiG-21 with its gun whilst being flown by Maj Bernard Bogoslofski and Capt Richard Huskey (USAF via Col. Ron Thurlow)



The jets passed a mere 200 ft from his Phantom II, Squier cooling an AIM-4 as he chandelled in afterburner to pursue the enemy.

He positioned his jet for a stern attack on the trailing MiG, and the red and white Falcon sped away from the F-4 and exploded in the tail section of the target aircraft, which began to trail thick, grey smoke. Squier then broke off to evade cannon fire from other MiGs that had assailed him and his wingman as he was launching his AIM-4.

Perched above the strike force in a MiGCAP flight was F-4D 'Tampa 01' of the 433rd TFS, flown by Maj Bernard J Bogoslofski and Capt Richard L Huskey ('GIB'). This crew decided to dive and pursue the 923rd FR MiG-17 that was chasing Squier's wingman, 'Olds 02'. Curving after the MiG in a tight left turn, Bogoslofski held it in his gunsight pipper through some deft manoeuvring and then set fire to the jet's left wing with his 20 mm SUU-23/A gun pod. The other 'Tampa' crews saw the pilot (probably Nguyen Hong Diep) take to his parachute.

Another Falcon kill occurred on a similar *Rolling Thunder* strike on 18 January, but on this occasion two F-4Ds were also lost, including the MiG killer, 'Otter 01'. Its crew, Maj Kenneth A Simonet (who had fought with the US Marine Corps in World War 2, joined the Army post-war and transferred to the USAF in 1952) and 'GIB' 1Lt Wayne Ogden Smith became PoWs until March 1973.

With a MiGCAP flight reduced to a single element by ECM malfunctions, the four 'Otter' F-4D strike aircraft had taken on a persistent quartet of MiG-17s themselves. One pair hit Simonet's wingman, Capt Bob Hinckley and 1Lt Robert Jones ('GIB'), and they ejected from their F-4D (66-7581) to also become long-term PoWs. Simonet and Smith followed another MiG in a series of climbing turns while the pilot prepared and fired an AIM-4, causing flames to burst from the target fighter's rear fuselage – it hit the ground with its pilot still in the cockpit. The F-4D had, in turn, been the target for a cannon-firing MiG-17 for much of

the encounter, and it scored enough hits to force the crew to eject from their blazing Phantom II.

The final Falcon success went to a 13th TFS crew Capt Robert G Hill and 1Lt Bruce Huneke ('GIB'), who were flying as 'Gambit 03' in a MiGCAP flight for a 5 February attack that cost the force an F-105 shot down by an 'Atoll' from a MiG-21. Having briefly lost sight of the two attacking MiGs, Hill's flight picked them up just as their leader completed his assault on the unfortunate 'Thud', and his wingman was seen to be climbing towards 'Gambit' flight. Capt Hill manoeuvred into the first MiG's 'deep six' position and gave it 100 rounds from his 20 mm gun pod. Having inflicted no visible damage, he cooled a Falcon and fired it. The missile never completed its pre-launch sequence, and consequently failed to guide properly. However, a second missile hit the MiG's rear fuselage and detonated.

For good measure Hill then followed through with a barrage of three AIM-7Es, only one of which actually launched and guided successfully. The second Falcon had already done its work, blowing away the rear fuselage of the MiG-21. Hill had, by then, climbed to 40,000 ft, and his wingman warned him that another MiG-21 had fired a K-13 'Atoll' his way. The missile passed horribly close to their F-4D, but it survived and was eventually preserved at Carswell AFB, Texas.

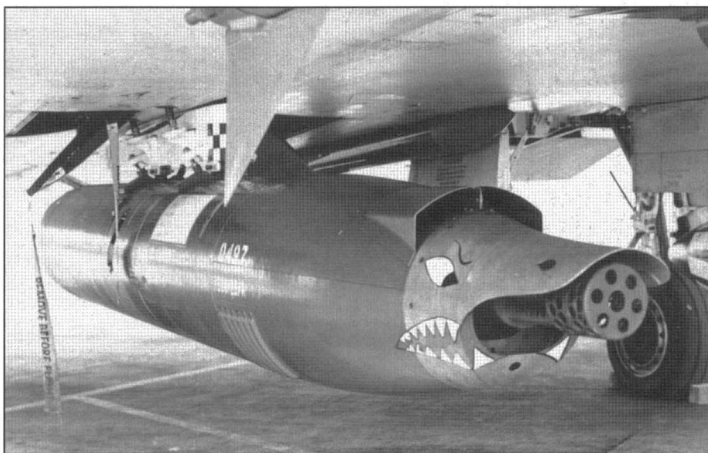
Five Falcon kills out of 48 attempted launches during *Rolling Thunder* were not enough to justify the missile's continued use as a major F-4 weapon, and its withdrawal proceeded as F-4Ds were progressively re-wired for AIM-9s. On 14 July 1968 the USAF terminated the engineering programme that would have produced a better Falcon by the following year (although it was resumed in 1970), but the missile remained in theatre until 22 August 1972, when the USAF declared 776 AIM-4Ds 'excess to SEA needs due to their limited air-to-air capability'. It marked the end of the combat career for a weapon that Robin Olds described to the author as being 'as useless as tits on a boar hog'.

GATLING GUNNERS

The AIM-4's success rate was so poor that it was exceeded by the F-4D's other 'new' weapon, the SUU-23/A gun pod, which was used to achieve six MiG kills. Employing the same M61A-1 gun (in its GAU-4 version) as used in the SUU-16/A, the SUU-23/A relied on gun-gas to power the rotary cannon, rather than the former's pop-out RAT electrical generator which restricted the F-4 to speeds of just 350-400 knots in combat. It also used an electrical inertia starter to spin the gun up more quickly to its 6000 rounds per minute top firing speed. Both pods carried 1200 rounds of linkless-feed ammunition.

The SUU-23/A was used to score the F-4D's second kill in October 1967 following a lengthy hiatus

A hungry-looking SUU-23/A gun pod mounted beneath an F-4D. The earlier SUU-16/A lacked the intake above the nose of the pod (Author's Collection)



during which there were no aerial successes for USAF Phantom IIs after 'Razz' Raspberry's 5 June victory. A major aerial battle on 23 August had resulted in the loss of three 'Triple Nickel' F-4Ds over the target, and the only kill in return was a MiG-17 shot by 1Lt David Waldrop in an F-105D.

By the autumn of 1967 VPAF pilots were more able to renew substantial opposition to the ongoing US strikes, and they rose in some force on 18 October, losing a MiG-17 to F-105 pilot Maj Don Russell. The 8th TFW resumed its run of successes six days later when the wing achieved its first kill with an SUU-23/A.

The 'Wolfpack's' Maj William L Kirk and 1Lt Theodore R 'Ted' Bongartz ('GIB') led a 'Buick' MiGCAP flight in a determined US response to the increased MiG activity – the first major USAF and US Navy assault on Phuc Yen air base. Post-strike Battle Damage Assessment (BDA) indicated that up to nine MiGs were destroyed on the ground, and a MiG-21 became Maj Bill Kirk's second aerial victim. On this occasion the victory came at the conclusion of an unusually extended, turning fight following an initial radar lock-on by Ted Bongartz at a range of four miles. After pursuing the silver MiG through a series of hard turns and dashes into clouds, Kirk, still with his wing tanks and SUU-23/A gun pod aboard, acquired a good AIM-7 solution and fired two missiles, without success.

When he had finally managed to jettison his fuel-filled 370-gallon tanks, his opponent seemed to be distracted for a moment by them falling away, and this provided the momentary opportunity that Maj Kirk needed. The MiG entered a series of wild turns, diving in and out of small clouds. Kirk's first missile exploded 25 ft from the VPAF fighter and may have damaged it. Closing fast on the still-turning 'Fishbed', the Phantom II pilot had to reach down to the armament switches low on the central front console and select 'guns'. Kirk very rapidly closed to around 600 ft, firing High Explosive Incendiary (HEI) shells that cut into the MiG's central fuselage. The pilot quickly ejected from his burning aircraft as it spun into the ground. 'Buick' flight then left the scene, passing the MiG pilot beneath his chute as the sky filled with 37 mm AAA rounds.

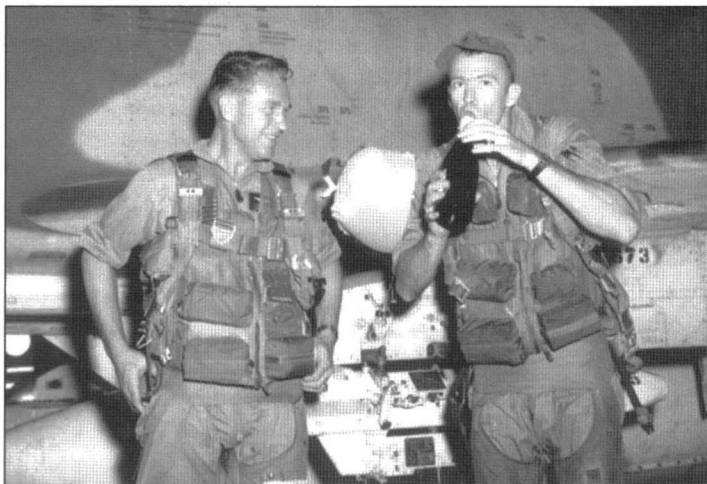
When equipped with a gun pod, the F-4 carried far greater firepower than a MiG-21. And if an F-4 crew could keep up their speed in a turning fight, they could also take advantage of the MiG-21's poorer rearward and downward visibility. However, throughout that autumn MiG pilots continually frustrated American strike aircraft by forcing them to jettison their bombs. This was most evident in September when 47 bombers had to release their ordnance prematurely in order to take evasive action. North Vietnamese GCI controllers were skilful in accurately directing MiGs expressly for this purpose, while other fighters were guided into optimum positions to draw away the escorting F-4s.

The next three 'gun pod kills' all involved the same rear-seater, 1Lt George H McKinney Jr. He had already experienced the sharp edge of



F-4D 66-7763 of the 433rd TFS hangs on the boom while MiG killer 66-7750 holds position on the tanker's right wing. Maj Bill Kirk shot down his second MiG in this F-4D, with 1Lt Theo Bongartz as his 'GIB'. On this mission the air-to-air armament appears to be only a pair of AIM-7s in the rear wells, with Mk 82 bombs and ECM pods on the wing pylons
(via Peter Shinkelshoek)

After their F-4D-30-MC (66-7533) was damaged by 57 mm AAA near Phuc Yen airfield in September 1967, 1Lt George McKinney and his pilot Major Lloyd 'Boots' Boothby coaxed the aircraft within 35 miles of Udorn before ejecting. Maj Boothby sustained a knee injury that required prolonged treatment at Clark AB before completing his 100 missions 'Up North'. He then went on to head the influential *Red Baron* investigation into USAF fighter tactics. In this picture, as George McKinney noted, 'by unanimous vote of Clark AB hospital nursing corps, Maj Boothby (left) was pronounced fit to fly', and he returned to Ubon in time to take George on his 100th mission North in May 1968. George samples the traditional 100 mission champagne here, and he returned for a second tour as a front-seater. He eventually flew his last combat sortie in December 1969 in (of course) F-4D 66-7601 (via Lt Col George McKinney)



combat on 19 September 1967 when the F-4D (66-7533) he occupied with his very experienced aircraft commander, Maj Lloyd 'Boots' Boothby, was hit over the North. McKinney recalled;

'In the hail of AAA over the target seven miles north of Hanoi on that day was a "Golden BB" which opened up a three-foot hole in the Phantom II's right wing, froze the right spoiler full up, immediately drained two of the three hydraulic systems and generally turned the day to crap! I mumbled an egress heading (and a few dozen prayers) while "Boots" used every increment of incredible aviation instincts, honed by countless hours at the edge of the envelope, to keep the F-4 airborne and headed away from the "Hanoi Hilton". Doing so required full manual depression of the left rudder pedal, and holding the stick within one inch of the left limit of travel.

'Despite the physical exertion, coupled with the precise touch necessary to remain airborne as the Black River receded behind the crippled Phantom II and rescue at least became a possibility, "Boots" managed to announce to the world on "guard" channel that they had so many warning lights lit up that it "looks like we've won a free game at the arcade".'

The crew ejected shortly afterwards, were soon recovered and were 'on their way to the bar'.

Conspicuously displaying their famous 'Eagle Squadron' design, these F-4Ds from the 435th TFS/8th TFW are topping off their tanks before heading North. The squadron's red trim was changed to black in 1968 and their codes altered to WP (for 'Wolf Pack') in 1973 (via Don Jay)



George McKinney's double SUU-23/A kill occurred on 6 November with aircraft commander Capt Darrel 'Dee' Simmonds, an 8th TFW staff member flying with the 435th TFS. McKinney remembers;

'We led "Sapphire" flight, one of two MiGCAP formations put up to cover an F-105 *Alpha* strike force ingressing from the "water side" 15 miles north of Haiphong. As the strike force went "feet dry", *Red Crown* called "Blue Bandits" (MiG-21s) south of our position. "Dee" called for the flight to jettison tanks, and then turned "Sapphire" flight south to screen the strike aircraft. From *Red Crown* calls, it appeared that the MiGs beat a hasty retreat back to Phuc Yen airfield, so "Dee" turned the flight back towards the direction of the strike.

'We were about half way from the coast to the north-east railroad when the "Thuds" started checking in as they came off the target. Mixed in with their "off target" calls were several calls of MiG sightings, and of MiGs shooting at "Thuds". We were flying almost due west towards the action at around 12,000 ft and a speed of just over Mach 1. I looked around the left side of the front seat and said to "Dee", "There they are. 'Eleven o'clock low'". "Dee", whose "fangs" were beginning to affect his enunciation, said, "Those are '105s". To this I quickly responded, "The last one ain't, 'Dee'. HE'S SHOOTING!"

'At this exact point in time there were 16 "Thuds" on the deck headed due east about a mile-and-a-half from us at our "ten o'clock" position, followed by (I thought) a single, silver MiG-17 who was rapidly being left in the "Thuds" jet-wash, but was nonetheless lobbing 37 mm "gumballs" towards the last F-105 in the pack.

"Tally ho!" screamed "Dee" and the fight was on! He slammed the throttles to full burner and did a 135-degree slice down to a position 1.5 miles behind the MiG at an altitude of about 1000 ft. He was so smooth on the controls that we lost very little airspeed during the manoeuvre, and therefore found ourselves overtaking said MiG at the proverbial "speed of heat".

"Dee" fired a very short burst from our gun pod just to ensure the MiG driver lost interest in the F-105. Boy, did he ever lose interest! I had heard all the briefings (and far more descriptive bar talk) about how a MiG-17 could turn, but there is nothing like seeing it first hand. From my perch in the Phantom II's rear seat it appeared to me that the MiG immediately went into a 90-degree left bank, stopped its nose on a single molecule of air and simply swapped ends!

'It was at this point that all of "Dee" Simmonds' experience, intelligence and aviation skills came fully into play. Rather than turn towards the MiG, he slammed the throttles to idle and applied about 6g, taking the F-4 into a near-vertical climb. As the airspeed was decreasing through 250 knots at an altitude of about 11,000 ft, "Dee" gently applied back stick, stomped on the left rudder pedal and re-engaged full 'burner. Quicker than one could say "YGBSM" (the "Wild Weasels" motto "You Gotta Be Shittin' Me"), we were in a 60-degree dive with airspeed rapidly accelerating through 450 knots.

'I had kept the MiG in sight throughout the manoeuvre, as had "Dee", but I was surprised that he had not yet pointed the Phantom II's nose at the MiG, now about 2.5 miles away. He hadn't done so because years of training had ingrained the instinct to maximise energy, and he allowed



Against the background of F-4D 66-7601 Capts McKinney (left) and Darrell 'Dee' Simmonds answer questions about their double MiG kill shortly after returning to base on 6 November 1967
(via Lt Col George McKinney)

our airspeed to again build slightly above the Mach as he slowly corrected our flight path to close with the MiG.

‘When we were about half-a-mile in trail the MiG began a hard, level left turn. “Dee” smoothly pulled lead and commenced a three-second burst of cannon fire as the range decreased through 2000 ft. He grunted “Got ’em!” (we were pulling about 4g at the time) and immediately began a high-speed yo-yo. At the instant of firing I had lost sight of the MiG below the nose of the F-4, but as “Dee” rolled slightly while we were gaining altitude I saw it in a 90-degree bank, just above the treetops and trailing heavy, grey smoke. At that instant the MiG’s canopy flew off and I saw the ejection seat come out just as it collided with the trees. I screamed an egress heading and we were on our way out of North Vietnam with over 10,500 lbs of gas in our jet and an honest-to-God MiG kill under our belt.

‘Less than five minutes later we were half way to “feet wet” when I turned to “check six” over my left shoulder. Somewhere during this act a silver flash, well below us, fought its way through to become a conscious realisation that I had just seen ANOTHER MiG! I informed “Dee” of my observation with the words, “Hey, there’s another one!” When he quite naturally enquired “Where?” my response was, “Right down there!” After a two-second pause to regain a modicum of professionalism I added, “Nine o’clock”, very low, going eight-thirty”.

‘Having finally been given a clue as to what section of the universe contained our adversary, it took “Dee” about three nanoseconds to visually acquire the target, engage ’burners and begin a slicing turn to the MiG’s “six o’clock”. We rolled out less than a mile behind our foe at an altitude of just under 200 ft and an overtake speed in excess of 100 knots. In scant seconds I could see a silver wingtip with a red star past either side of our front ejection seat, and even with my three whole minutes of air combat experience, I thought (aloud, as it turned out) that it was about time we took a shot – or did something!

‘Simultaneously with this thought, the MiG driver went into a shallow left bank to avoid an upcoming hill. “Dee” used about 2g to pull lead and pressed the trigger. The first HEI round must have gone dead centre through the MiG’s fuel tank, because the 150 or so rounds that followed ended up in a massive fireball in the sky. About two seconds later so did our F-4! Fire on both sides of the canopy, two heavy thumps and we were out of the fireball and executing a climbing left turn. However, unexcelled exhilaration swiftly turned to serious concern, for both of us were convinced that our Phantom II had just eaten about half of a MiG-17. The gauges remained steady, the jet flew fine and we were soon on our way to the coast, and safety, with over “eight grand” of JP-4 still in the tanks.

‘As we were going “feet wet”, *Red Crown* was calling “Bandits” north, south, east and west of our position, and “Dee” briefly entertained thoughts of turning back to engage. Situational awareness, including the facts that we had already enjoyed a pretty good day and all the strike force was out of RP V and IV, prevailed. We headed to the tanker, Ubon and a *major* celebration.

‘The double cannon kill was so unusual that “Dee” and I were flown to Saigon in a T-39 for a round of “meet the press”. The powers that be decided that we shouldn’t fly ourselves in an F-4, what with our blood alcohol levels still being above 30 per cent. While in Saigon we were

ushered into the outer office of Gen Momyer, Commander, Seventh Air Force, and we were told that he would be with us soon to make spontaneous awards of Silver Stars. Unfortunately, more pressing matters occupied the general's time.'

'Dee' Simmonds completed his 100-mission tour and eventually received the Silver Star. George McKinney received a DFC.

Lt McKinney scored again in the same aircraft (66-7601) on 19 December, two days after Capt Doyle Baker had attempted an SUU-23/A kill but resorted to an AIM-4. This time another 'superior fighter pilot' (in George's estimation), Maj Joseph D Moore, was the 'nose gunner' of the lead MiG-CAP aircraft, 'Nash 01'. MiG tactics changed again that day, with six MiG-21s and up to eight MiG-17s working in coordinated multiple passes from different directions.

A handful of MiG pilots were very experienced in combat by this stage in the war, some having been in the frontline since 1965. Like their German counterparts in World War 2, they did not fly 'tours of duty', but remained in action for the duration of the conflict. Conversely, most of the original cadre of experienced USAF pilots had been rotated out at the end of their 100-mission tours, and their replacements often had little or no fighter experience. Increasingly, they came from 'fast track' fighter conversion courses that did not allow time for the finer points of aerial combat.

A further change was that the 921st FR was ordered to provide a standing airborne patrol of MiG-21s – a tactic that had probably cost the 388th TFW two of the four F-105s it lost in an 18 November strike on Phuc Yen.

The 19 December mission involved two US strike formations, and all the aircraft from the first one were forced to jettison their ordnance when faced with some intense MiG activity. A second force followed shortly afterwards and reached the target successfully. Flying as 'Nash 01', Maj Moore was escorting the first wave when he saw four MiG-17s working their way through the strike force. George McKinney takes up the story;

'This time the strike force was entering from the "land side" (north-east Laos). Our CAP flight and another F-4 formation were just joining up with the F-105s near the "elbow" in the Black River at about 1430Z when the "Thuds" were jumped by a large number of MiG-17s. To put it mildly, a giant "furball" ensued. All types of aircraft were going every which way, there were missiles in the air and bombs and tanks were being hastily jettisoned.

'In the midst of this "fog of war" Maj Moore spotted a MiG-17 approximately three miles ahead at our "12 o'clock", and I obtained a

Maj George McKinney boards F-4D-30-MC 66-7601 for another 'business trip up North' with Maj Joe Moore on 19 December 1967. An additional half-star was added to the MiG kill score board when they returned to Ubon (via Lt Col George McKinney)



radar lock-on. As we were closing to maximum Sparrow range, an F-105 with a MiG-17 in hot pursuit flew directly across our flightpath, about a mile in front of us. Immediately forsaking what appeared to be a sure kill, Joe Moore turned hard right to help the "Thud" with his "little MiG problem". They were in a descending right turn, passing through 6000 ft AGL (Above Ground Level). Maj Moore skilfully arced the circle, performed a beautiful left barrel roll and obtained a moderate deflection gun shot at the MiG from about 1500 yards. I saw at least two "sparkles" from the MiG's aft fuselage, whereupon he seemed to relax all gs and began to trail wispy, white smoke.

'As Joe went into the vertical to avoid an overshoot, that little voice in my head (probably an echo of "Boots" Boothby's many lessons) said "Check six!" I did so and discerned a MiG-17 about two miles behind us, with an approximate 30-degree track-crossing angle. I mentioned our new playmate to Maj Moore, whereupon he broke hard into the MiG, totally defeating its attack. Joe then "unloaded" the F-4 to zero g and put a lot of distance between us and the threat by continuing downhill into the Black River Valley. By the time we separated and pitched back into the fight it was all over. Not a MiG to be seen anywhere! Lots of plumes of smoke from jettisoned ordnance, and no way to identify the grave of the MiG we had fired on.

'We returned to Ubon, debriefed, wrote our narrative for the Claims Evaluation Board and went to the bar, not knowing how happy we ought to be. About 2130 hrs that evening we received a call from Seventh Air Force saying that there were conflicting claims, and we and an F-105F driver (Capt Philip Drew, piloting a 355th TFW *Iron Hand* with Maj William Wheeler) would be awarded half a MiG each. That's how I became the only "half ace" of the Vietnam War.'

Four days later, on a mission with 'Boots' Boothby, George McKinney was diverted to Korat RTAB, where President Lyndon Johnson walked into the bar room to hear some war stories, including George's. The next morning (Christmas Eve 1967) the two men were awarded DFCs by the President for their 19 September mission;

'Probably the height of irony to be decorated by the President for losing an aircraft! Soon after the medal ceremony, "Boots" and I drove back to Ubon, arriving just ahead of Mr Bob Hope and his troupe. We drove a Ford Thunderbird convertible up to Mr Hope's C-130, sat Raquel Welch, "Miss World" and several other ladies on top of the back seat and I poured them champagne as "Boots" drove them to the stage!'

George McKinney returned for another SEA tour, flying his final combat mission in his MiG killer 66-7601, and later transitioning to the F-15 Eagle. Joe Moore subsequently led the USAF Thunderbirds team, retiring as a major general.

THUNDER ROLLS AWAY

The 8th TFW destroyed four more MiGs in February 1968 before the air war against the North was suspended with the end of *Rolling Thunder*. One was achieved with a gun pod, but the AIM-7E was the weapon of choice for the remaining three.

The day after Capt Hill and 1Lt Huneke's last shot with the AIM-4, on 5 February, 433rd TFS crew Capt Robert Boles and 1Lt Robert B

F-4D-31-MC 66-8690, flown by Lt Col Alfred Lang and 1Lt Randy Moss, destroyed a MiG-21 on 12 February 1968, but was duly lost to AAA on an 8th TFW 'Wolf Fast-FAC' sortie over Mu Gia Pass on 28 January 1969 after only 18 months' USAF service (USAF via Chris Hobson)



Battista ('GIB') were flying as 'Buick 04' in a 'fast CAP' foursome covering a 'Commando Club' F-105 strike egress route.

Two MiG-21s passed five miles off their right, above their rear quarter, forcing 'Buick' to break formation and seek them out. Three F-4Ds aimed missiles at a MiG without success, while Capt Boles waited for his element leader, Capt Aronoff, to give him clearance to fire. Both 'Buick 01' and '03' shot off a pair of Sparrows each, but all misfired or missed the target – the motors in 'Buick 01's' second pair failed to ignite and 'Buick 03's' follow-up brace of AIM-9Es didn't guide. 'Buick 02' then released an AIM-9E, while promptly headed straight for Boles' Phantom II, requiring some desperately violent evasion on the latter's behalf!

As the unscathed MiG continued its dash for home amidst this firepower demonstration, the three F-4Ds that still had missiles aboard all fired one simultaneously. In Capt Boles' case his first shot also failed to launch, but he salvoed a second, which appears to have been the AIM-7 that struck the MiG. In all, the four F-4Ds had launched, or attempted to launch, 14 missiles.

It was the 435th TFS's turn on 12 February during a strike on the Cao Nung railyard. The 'Wolfpack' provided two MiGCAP flights to cover the strike force's departure from the target, and 'Buick' flight tracked two MiGs. The flight lead crew, Lt Col Alfred E Lang and 1Lt Randy P Moss ('GIB'), attained a lock-on at 22 miles and closed to six miles, with the aim dot centred on what turned out to be a MiG-21. Lang fired two AIM-7Es in 'textbook' conditions at a range of 4.5 miles and a speed of Mach 1.3. Both missiles slammed into the second MiG, which tumbled into an uncontrollable spin. Lt Col Lang then acquired a lock-on to the leading MiG, flying three miles ahead of his crippled wingman, and closed to ten miles before having to abandon his attack run as 'Buick 04' reached 'bingo' fuel.

Meanwhile, Col Robert V Spencer and 1Lt Richard Cahill ('GIB'), in 'Buick' 03, had fired two Sparrows at the lead MiG, and both seemed to explode close enough to cause the fighter to spin out of control. The crews of 'Buick 02' and '04' were also convinced that the explosions had been close enough to prove fatal, although 'Buick 04's' pilot, 1Lt Gerald Crosson Jr, cast doubt on the proximity of the explosions to the target. The claim was disallowed by Seventh Air Force.

Two further successes came out of another attack on Phuc Yen air base on 14 February. Two 8th TFW MiGCAPs were involved, a 433rd TFS CAP with AIM-4s and AIM-7s, led by the 'Wolfpack's' Deputy Commander for Operations, Col David O Williams, and a 'Triple Nickel' CAP led by their squadron commander, Lt Col Wesley 'Red' Kimball. The latter flight boasted some gun pod-toting F-4Ds.

The force received accurate *Rivet Top* warnings of two MiG-21s on approach to the target, but they turned away. David Williams spotted the contacts soon after the warnings came through;

'They were well above us, and since they were pulling contrails, we acquired them quickly and I turned my flight to intercept them. They must have been under tight ground radar control because when we began closing on them, they made a hasty 180-degree turn to the north in the direction of the sacrosanct buffer zone abutting the Chinese border with North Vietnam. Perhaps they were attempting to sucker us away from a trap they were hoping to spring against our strike flight – four 433rd TFS F-4Ds and two *Iron Hand* F-105 flights – because at about that time we received warning calls from radar surveillance aircraft that eight "Red Bandits" (i.e. MiG-17s) were airborne in the vicinity of "Thud Ridge". This put them athwart the strike force's route.

'Hearing that, I turned my flight back to join the strike force, and shortly thereafter heard a "Tally ho" from "Red" Kimball's "Nash" flight. Almost at the same time my "GIB", 1Lt Jim Feighny, called over the intercom that we had four "Red Bandits" at "two o'clock" low. I quickly spotted them and noted that they had formed into the old Soviet "wagon wheel" defensive manoeuvre. I plugged in both afterburners to go max power, pulled up into a steep climbing right turn, rolled inverted so as to keep my eyes on the MiGs and then did a "split-s" and dived down, rolling out to a position astern and slightly below a silver-grey MiG-17 in a lazy, right-hand orbit. I don't think he ever saw me.

'Approaching the MiG at about 1.2 Mach, I asked my "GIB" if his radar was locked on to the target. He replied that he was locked onto a target, but wasn't sure if it was the target I was looking at, so he asked me to put the piper on my target, selected "gyro out" mode and re-locked. I fired one AIM-7E in full-systems lock-on, interlocks in and in-range light on from about three to four nautical miles (almost minimum range for the missile to arm properly). The Sparrow tracked perfectly and appeared to approach the port side of the MiG's fuselage when the proximity fuse detonated the missile's warhead with a huge orange fireball, severing the MiG's empennage. The forward fuselage and wing section began snapping violently end-over-end, falling forward and downward.

'Passing to the port side of the fireball and debris, I commenced a steep, high-speed yo-yo to clear my tail, and when I looked to the rear I observed a parachute with orange and white panels billowing above the MiG pilot. I was amazed that he had escaped the violent break-up of his aircraft and the fireball.

'When I topped out of my climb, I rolled out in a right turn to attempt to acquire the other MiGs. As I did, my "GIB" called out another bandit at about "one

Col David O Williams (left) receives a bottle of champagne to mark his final 'Wolfpack' mission from Ubon in May 1968. Making the award is 435th TFS CO Bill Tetrault, newly promoted to colonel (USAF via Brig Gen D O Williams)





F-4D-30-MC 66-7554 TRAPPER at Udorn on 27 April 1971. It scored the last MiG kill of the *Rolling Thunder* period (Larsen/Remington Collection via Richard L Ward)

o'clock, slightly high", about two nautical miles' distant. He quickly locked onto the MiG-17, which was in a slight turn to starboard, and I fired one AIM-7E well within range of the target. The missile was tracking the MiG well, as I kept the steering circle on the target, when my "GIB" called out rather emphatically that we had a Bandit approaching us fast from "four o'clock low".

'I diverted my attention to look back at this new threat, and sure enough one of the MiG-17s had tried to zoom up to our perch. He was well in gun range of us, but apparently couldn't pull enough lead to hit us. He was stalling out, and had to perform a wing-over to keep from departing controlled flight.

'Unfortunately, while my attention was diverted from attacking the second target MiG, I had let the steering circle drift slightly aft of the target while the Sparrow was tracking. Consequently, the missile detonated just aft of the MiG's tailpipe without damaging him perceptibly. I was so upset that I wanted to keep on pursuing the MiGs – both the one I had missed and the one that had tried to attack us from below. But at that moment my wingman called and said he was at "no shit bingo" fuel state, which was understandable since we had been running in afterburner for about five minutes or so. As a leader, it was my responsibility to give paramount importance to the safety of my wingman, so we reformed the flight and began our egress from the area of hostilities.'

Two MiG-21s (possibly the pair first sighted) subsequently threatened one of the rear F-105 flights, forcing it to jettison its bombs and return to Korat RTAB. 'Red' Kimball also charged through the 'wheel', attempting to make an AIM-4 attack, but his missile would not give the correct tone. One of the MiG-17s broke out to follow Kimball's element through, and F-4D 'Nash 03' set off in pursuit of the VPAF fighter. Its crew, Maj Rex D Howerton and 1Lt Ted Voigt ('GIB') set up and fired a Falcon from 2500 ft behind the MiG. Fearful that his missile would fail to make contact, Maj Howerton then switched to 20 mm cannon and managed to score enough hits on the MiG to blow it up. He was not able to see whether his Falcon also made it to the target, which shed its left wing and

complete tail section as it hurtled earthwards.

Upon returning to Ubon, David Williams was reminded of the 8th TFW tactical doctrine that AIM-7s should be fired at a target two at a time;

‘At debriefing, I was accosted by the vice wing commander because I had fired only single Sparrows at each of the targets I had attacked. I responded that in each instance I was rushed by the ongoing circumstances, such as minimum range, steering the missile, having my attention diverted by the MiG which tried to attack me and simply concentrating on the tasks before me. Thank God we now have “fire and forget” missiles in the inventory that obviate the steering task by pilots!’

The MiG kills of 14 February were the last of the *Rolling Thunder* period, and no more occurred until the 8th TFW resumed operations over the North four years later. In the first two months of 1968, the VPAF had emerged as a much stronger, better-organised force that had accounted for 17 per cent of the USAF aircraft lost over the North. In 1966 this figure was six per cent, and in May 1965 22 MiGs were destroyed for the loss of only two F-4Cs. By early 1968 that situation had altered considerably.

From August 1967 to the end of February 1968, 22 USAF aircraft were lost to MiGs and only 20 MiG kills were awarded – a ratio of 1.1-to-1 in favour of the VPAF. Six Phantom IIs were destroyed for the loss of four MiG-21s, and the 8th TFW’s August 1967 record of a 6-to-1 kill ratio was reduced to 1.5-to-1, with only three MiG-21s downed.

Better use of the MiG-21 ‘Fishbed-C/D’ was one of the main reasons for this setback, the aircraft dominating the F-105 with a 16-to-1 kill ratio. USAF F-4s only managed a 2-to-1 ratio against the MiG-21 during the entire war. In fact Air Force strategists had forecast that the MiG-21 might even command a 3-to-1 ratio against F-4Cs at high altitude, although this was modified to 5-to-1 in the Phantom II’s favour when it was found that most combats were taking place lower down.

All but one of the MiG-21’s kills were achieved with ‘Atolls’, and the aircraft carried considerably less armament than an F-4, with only two of these AIM-9B copies. The ‘Fishbed-C’ also had a 30 mm



Col D O Williams conducts a pre-flight check of his F-4D at Ubon RTAB in November 1967. The fighter has been load with four AIM-7s, four AIM-4Ds, an SUU-23/A gun and two AN/ALQ-87 ECM jamming pods (via Brig Gen D O Williams)

Col Darrell S Cramer, CO of the 432nd TRW, took over F-4D 66-7554/OY as his personal jet when it redeployed to Thailand in 1970. Its sole aerial victory came on 14 February 1968, although the F-4 wore two kills for most of its subsequent career, including its final operational period as the CO’s jet of the reserve-manned 89th TFS/906th TFG (via Peter Schinkelshoek)





Another photograph of F-4D 66-7554, the last MiG killer of *Rolling Thunder*. It is seen at Udorn with the 'Triple Nickel' logo on its vari-ramp. The jet spent its final years in service with the Wright-Patterson-based 89th TFS/906th TFG, which was in turn assigned the USAF Reserve. Marked up as *City of Fairborn I*, 66-7554 was placed on display guarding the main gate at Wright-Patterson AFB in May 1989 following the unit's re-equipment with the F-16A/B (Don Jay Collection)

In this regime they could make full use of their small cross section, speed and smokeless engines to strike and escape unseen. MiGs that stayed to fight it out with the Phantom IIs invariably came off worst, and USAF pilots encountered few MiG drivers who showed much competence in ACM. This was mainly due to their rigid Soviet training, but partly it reflected the difficulty slightly-built Vietnamese pilots experienced when forced to man-handle jet fighters in physically demanding dogfighting manoeuvres.

However, the fact remains that MiG-21 pilots shot down 17 US aircraft between August 1967 and 5 February 1968 for the loss of just two of their own. Overall, in *Rolling Thunder* they shot down 24 American aircraft and lost 25. The MiG-17 fared less well, shooting down no US jets from May to December 1967 and losing 20 to USAF F-4s in return. The tables turned briefly in the latter month, when four F-4Ds were lost to them within two months, but two more MiG-17s (and three MiG-21s) went down in February 1968.

On 1 April 1968 President Johnson ended the first half of the air war against North Vietnam. Of the 86 kills awarded to USAF crews, 59 went to F-4C/D flyers. During *Rolling Thunder* Phantom II pilots had fought a MiG force that had many advantages – excellent GCI control that made up for many of the shortcomings in its pilots, a purpose-built, short-range interceptor in the MiG-21 and the incalculable advantage of operating over home territory.

US crews flew heavily-laden fighters over very long distances with limited warning of MiG threats and highly restrictive Rules of Engagement that negated many of their technological advantages. Their primary aim was invariably to deliver bombs and survive the flak, SAMs, weather, in-flight refuelling, exhaustion and the complexity of their tasks. Air-to-air engagements were just one more problem to face, rather than the sole priority, as they were for MiG pilots.

Although the Phantom II crews' successes against the MiGs brought the VPAF to its knees on several occasions, they also demonstrated the need for improvements in both fighters and tactics. For the next phase of the air war in 1972-73, F-4 pilots had better airborne warning and control, a gun-armed Phantom II variant and the early stages of the air combat training that would enable them to comprehensively defeat the MiG-21 units.

cannon, but this was deleted in the D-model. Despite this, the fighter proved extremely damaging to US F-4s.

Whereas only 18 per cent of Phantom IIs hit by AAA and 59 per cent hit by SAMs were total losses, some 88 per cent hit by MiGs went down. The MiG pilots' success, however, was heavily dependent upon expert GCI giving them the advantage of single, supersonic slashing attacks from the rear quarter, accelerating away to safety in China at 1.8 Mach.

APPENDICES

USAF F-4 PHANTOM II MiG KILLERS 1965-68

Date	MiG type	F-4 type/Serial/Code	Unit	Crew	Callsign	Weapon
10 July 1965	MiG-17	F-4C 64-0693	45th TFS/2nd AD	Capt K E Holcombe/Capt A C Clark	'Mink 03'	AIM-9B
10 July 1965	MiG-17	F-4C 64-0679	45th TFS/2nd AD	Capt T S Roberts/Capt R C Anderson	'Mink 04'	AIM-9B
23 April 1966	MiG-17	F-4C 64-0699	555th TFS/8th TFW	Capt R E Blake/1Lt S W George	'Mink 04'	AIM-7D
23 April 1966	MiG-17	F-4C 64-0689	555th TFS/8th TFW	Capt M F Cameron/1Lt R E Evans	'Mink 03'	AIM-9B
26 April 1966	MiG-21	F-4C 64-0752	480th TFS/35th TFW	Maj P J Gilmore/1Lt W T Smith	'Mink 01'	AIM-9B
29 April 1966	MiG-17	F-4C 64-0696	555th TFS/8th TFW	Capt W B D Dowell/1Lt H E Gossard	'Mink 03'	AIM-9B
29 April 1966	MiG-17	F-4C 64-0697	555th TFS/8th TFW	Capt L R Keith/1Lt R A Bleakley	'Mink 01'	Manoeuvring
30 April 1966	MiG-17	F-4C (serial unknown)	555th TFS/8th TFW	Capt L H Golberg/1Lt G D Hardgrave	'Bango Alpha 04'	AIM-9B
12 May 1966	MiG-17	F-4C 64-0660	390th TFS/35th TFW	Maj W R Dudley/1Lt I Kringelis	'Jupiter 03'	AIM-9B
14 July 1966	MiG-21	F-4C (serial unknown)	480th TFS/35th TFW	1Lt R G Martin/1Lt R N Kreips	'Jupiter 02'	AIM-9B
14 July 1966	MiG-21	F-4C 63-7489	480th TFS/35th TFW	Capt W J Swendner/1Lt D A Buttell Jr	'Jupiter 01'	AIM-9B
16 September 1966	MiG-17	F-4C 63-7650	555th TFS/8th TFW	1Lt J W Jameson/1Lt D B Rose	'Jupiter 04'	AIM-9B
5 November 1966	MiG-21	F-4C 63-7541	480th TFS/366th TFW	Maj R E Tuck/1Lt J J Rabeni Jr	'Opal 01'	AIM-7E
5 November 1966	MiG-21	F-4C 63-7535	480th TFS/366th TFW	1Lt W J Latham/1Lt K J Klaus	'Opal 02'	AIM-9B
2 January 1967	MiG-21	F-4C 64-0838/FG	433rd TFS/8th TFW	Maj P P Combies/1Lt L R Dutton	'Rambler 04'	AIM-7E
2 January 1967	MiG-21	F-4C 64-0720/FG	433rd TFS/8th TFW	Capt J B Stone/1Lt C P Dunnegan Jr	'Rambler 01'	AIM-7E
2 January 1967	MiG-21	F-4C 63-7652/FG	433rd TFS/8th TFW	1Lt J R Glynn, Jr /1Lt L E Cary	'Rambler 02'	AIM-7E
2 January 1967	MiG-21	F-4C 63-7680/FP	555th TFS/8th TFW	Col R Olds/1Lt C Clifton	'Olds 01'	AIM-9B
2 January 1967	MiG-21	F-4C 63-7683/FY	555th TFS/8th TFW	Capt W S Radeker III/1Lt J E Murray III	'Olds 04'	AIM-9B
2 January 1967	MiG-21	F-4C 63-7710/FY	555th TFS/8th TFW	Capt E T Raspberry Jr/ 1Lt R W Western	'Ford 02'	AIM-9B
2 January 1967	MiG-21	F-4C 63-7589/FY	555th TFS/8th TFW	1Lt R F Wetterhahn/1Lt J K Sharp	'Olds 02'	AIM-7E
6 January 1967	MiG-21	F-4C 64-0849/FY	555th TFS/8th TFW	Maj T M Hirsch/1Lt R J Strasswimmer	'Crab 02'	AIM-7E
6 January 1967	MiG-21	F-4C 64-0839/FY	555th TFS/8th TFW	Capt R M Pascoe/1Lt N E Wells	'Crab 01'	AIM-7D
23 April 1967	MiG-21	F-4C 64-0776	389th TFS/366th TFW	Maj R D Anderson/Capt F D Kjer	'Jupiter 03'	AIM-7E
26 April 1967	MiG-21	F-4C 64-0797	389th TFS/366th TFW	Maj R W Moore/1Lt J F Sears	'Cactus 01'	AIM-7E
1 May 1967	MiG-17	F-4C 63-7577	390th TFS/366th TFW	Maj R G Dilger/1Lt M Thies	'Stinger 01'	Manoeuvring
4 May 1967	MiG-21	F-4C 63-7668/FY	555th TFS/8th TFW	Col R Olds/1Lt W D Lafever	'Flamingo 01'	AIM-9B
13 May 1967	MiG-17	F-4C 64-0739/FG	433rd TFS/8th TFW	Maj W L Kirk/1Lt S A Wayne	'Harpoon 01'	AIM-9B

Date	MiG type	F-4 type/Serial/Code	Unit	Crew	Callsign	Weapon
13 May 1967	MiG-17	F-4C 63-7680/FG	433rd TFS/8th TFW	Lt Col F A Haeffner/1Lt M R Bever	'Jupiter 03'	AIM-7E
14 May 1967	MiG-17	F-4C 63-7699/CG	480th TFS/366th TFW	Maj S O Bakke/Capt R W Lambert	'Elgin 01'	AIM-7E
14 May 1967	MiG-17	F-4C 64-0660/CE	480th TFS/366th TFW	Maj J A Hargrove/1Lt S H DeMuth	'Speedo 01'	SUU-16/A
14 May 1967	MiG-17	F-4C 63-7704/CS	480th TFS/366th TFW	Capt J T Craig/1Lt J T Talley	'Speedo 03'	SUU-16/A
20 May 1967	MiG-21	F-4C 64-0748/AD	389th TFS/366th TFW	Maj R D Janca/1Lt W E Roberts Jr	'Elgin 01'	AIM-9B
20 May 1967	MiG-21	F-4C 64-0777	389th TFS/366th TFW	Lt Col R F Titus/1Lt M Zimer	'Elgin 03'	AIM-7E
20 May 1967	MiG-17	F-4C 63-7623/FG	433rd TFS/8th TFW	Maj J R Pardo/1Lt S A Wayne	'Tampa 03'	AIM-9B
20 May 1967	MiG-17	F-4C 64-0829/FG	433rd TFS/8th TFW	Col R Olds/1Lt S B Croker	'Tampa 01'	AIM-7E
20 May 1967	MiG-17	F-4C 64-0829/FG	433rd TFS/8th TFW	Col R Olds/1Lt S B Croker	'Tampa 01'	AIM-9B
20 May 1967	MiG-17	F-4C 64-0673/FG	433rd TFS/8th TFW	Maj P P Combies/1Lt D L Lafferty	'Ballot 01'	AIM-9B
22 May 1967	MiG-21	F-4C 64-0776/AK	389th TFS/366th TFW	Lt Col R F Titus/1Lt M Zimer	'Wander 01'	AIM-9B
22 May 1967	MiG-21	F-4C 64-0776/AK	389th TFS/366th TFW	Lt Col R F Titus/1Lt M Zimer	'Wander 01'	SUU-16/A
5 June 1967	MiG-17	F-4C 64-0660/CE	480th TFS/366th TFW	Maj D K Priestester/Capt J E Pankhurst	'Oakland 01'	SUU-16/A
5 June 1967	MiG-17	F-4C 63-7647/FY	555th TFS/8th TFW	Maj R M Pascoe/Capt N E Wells	'Chicago 02'	AIM-9B
5 June 1967	MiG-17	F-4D 66-0249/FY	555th TFS/8th TFW	Maj E T Raspberry/Capt F M Gullick	'Drill 01'	AIM-7E
24 October 1967	MiG-21	F-4D 66-7750/FG	433rd TFS/8th TFW	Maj W L Kirk/1Lt T R Bongartz	'Buick 01'	SUU-23/A
26 October 1967	MiG-17	F-4D 66-7565	555th TFS/8th TFW	Capt L D Cobb/Capt A A Lavoy	'Ford 04'	AIM-4D
26 October 1967	MiG-17	F-4D 66-7546/FY	555th TFS/8th TFW	Capt W S Gordon III/1Lt J H Monsees	'Ford 03'	AIM-7E
26 October 1967	MiG-17	F-4D 66-0274/FY	555th TFS/8th TFW	Capt J D Logeman/1Lt F E McCoy II	'Ford 01'	AIM-7E
6 November 1967	MiG-17	F-4D 66-7601/FO	435th TFS/8th TFW	Capt D D Simmonds/1Lt G H McKinney Jr	'Sapphire 01	SUU-23/A
6 November 1967	MiG-17	F-4D 66-7601/FO	435th TFS/8th TFW	Capt D D Simmonds/1Lt G H McKinney Jr	'Sapphire 01'	SUU-23/A
17 December 1967	MiG-17	F-4D 66-8719/OC	13th TFS/432nd TRW	Capt D D Baker (USMC)/1Lt J D Ryan Jr	'Gambit 03'	AIM-4D
19 December 1967	MiG-17	F-4D 66-7601/FO	435th TFS/8th TFW	Maj J D Moore/1Lt G H McKinney Jr	'Nash 01'	SUU-23/A
3 January 1968	MiG-21	F-4D 66-7748/FG	433rd TFS/8th TFW	Maj B J Bogoslofski/Capt R L Huskey	'Tampa 01'	SUU-23/A
3 January 1968	MiG-21	F-4D 66-7594/FO	435th TFS/8th TFW	Lt Col C D Squier/1Lt M D Muldoon	'Olds 01'	AIM-4D
18 January 1968	MiG-17	F-4D 66-8720/FO	435th TFS/8th TFW	Maj K A Simonet/1Lt W O Smith	'Otter 01'	AIM-4D
5 February 1968	MiG-21	F-4D 66-8714/OC	13th TFS/432nd TRW	Capt R G Hill/1Lt B V Huneke	'Gambit 03'	AIM-4D
6 February 1968	MiG-21	F-4D 66-8688/FO	433rd TFS/8th TFW	Capt R H Boles/1Lt R B Battista	'Buick 04'	AIM-7E
12 February 1968	MiG-21	F-4D 66-8690/FO	435th TFS/8th TFW	Lt Col A E Lang Jr/1Lt R P Moss	'Buick 01'	AIM-7E
14 February 1968	MiG-17	F-4D 66-7661/FO	435th TFS/8th TFW	Col D O Williams/1Lt J P Feighny Jr	'Killer 01'	AIM-7E
14 February 1968	MiG-17	F-4D 66-7554/FY(?)	555th TFS/8th TFW	Maj R D Howerton/1Lt T L Voigt II	'Nash 03'	SUU-23/A

COLOUR PLATES

1

F-4C-22-MC 64-0693 of Capt K E Holcombe and Capt A C Clarke, 45th TFS/2nd AD, Ubon RTAB, July 1965

This aircraft was delivered to the 15th TFW at MacDill AFB, Florida, on 13 May 1965 and then flown to Ubon RTAB for service with the 45th TFS, which was deployed with the 2nd AD at the time. It had the distinction of claiming the USAF's first aerial victory of the Vietnam War when its crew downed a MiG-17 on 10 July 1965. 64-0693 was subsequently destroyed on 30 July 1967 during a 559th TFS/12th TFW night armed road reconnaissance mission near Ba Binh, eight miles north of the Demilitarized Zone. It remains unclear whether the jet was hit by AAA or accidentally flown into the ground by its crew, Capt T R Allen and 1Lt R L Packard ('GIB'), both of whom were killed.

2

F-4C-22-MC 64-0679 of Capt T S Roberts and Capt R C Anderson, 45th TFS/2nd AD, Ubon RTAB, July 1965

Delivered to the 15th TFW at MacDill AFB on 31 March 1965, this machine was also taken to Ubon RTAB by the 45th TFS – the squadron was based in Thailand from 4 April through to 10 August 1965. Like 64-0693 seen in the previous profile, 64-0679 claimed a MiG-17 destroyed on 10 July 1965. The jet returned to South-East Asia when it was assigned to the 12th TFW at Cam Ranh Bay AB in March 1966, and it later served with both the 479th TFW (March 1970) and the 35th TFW (October 1971) at George AFB, California. The veteran fighter completed its USAF service with the Air National Guard (ANG), flying with the Illinois-based 170th TFS/183rd FG from April 1972 and the Oregon-based 123rd FIS/142nd FIG from April 1981. Retired in 1988, 64-0679 was supplied to Misawa AB, Japan, as a battle damage repair airframe in August of that year, and was subsequently restored and put on display at the base in September 1992.

3

F-4C-22-MC 64-0699 of Capt R E Blake and 1Lt S W George, 555th TFS/8th TFW, Udorn RTAB, April 1966

This aircraft was delivered to the 12th TFW at MacDill AFB on 4 May 1965, and accompanied the wing to Cam Ranh Bay in November of that year. Serving with the 555th TFS, it was transferred with the squadron to 8th TFW control (via the Okinawa-based 51st FIW) in March 1966, but remained at Udorn RTAB. 64-0699 claimed the 'Wolfpack's' first MiG kill on 23 April 1966. The fighter returned to the 12th TFW in May 1967, then moved to the 35th TFW and the 41st AD in December 1967. Later service was with the 347th TFW (from January 1968) at Yokota AB, Japan, and the 4453rd CCTW

(December 1969) and 355th TFW (from September 1971), both at Davis-Monthan AFB, Arizona. It served with the 58th TFW, at Luke AFB, Arizona, from October 1971, then moved to the 35th TFW at George AFB in August 1976, before returning to Luke and the redesignated 58th TFW in April 1977. Subsequent ANG service was with the 111th FIS/147th FIG in Texas in 1982 and the Oregon-based 123rd FIS/142nd FIG from 1987. Retired to the Aerospace Maintenance and Regeneration Center (AMARC) at Davis-Monthan in July 1989, the fighter was put on display at the base in July 1990. The aircraft's 'GIB' on its MiG killing mission, 1Lt 'Dub' George, lost his life on 20 July 1966 when battle-damaged 555th TFS F-4C 63-7695 crashed during an emergency landing at night at Udorn RTAB.

4

F-4C-23-MC 64-0752 of Maj P J Gilmore and 1Lt W T Smith, 480th TFS/35th TFW, Da Nang, April 1966

Delivered to the 366th TFW at Holloman AFB, New Mexico, on 25 June 1965, this aircraft came under 35th TFW charge, via the 6252nd TFW, in South Vietnam in early April 1966, before reverting back to 366th TFW control when the latter wing swapped designations with the 35th TFW. Having been in-theatre for just a matter of days, 64-0752 claimed the very first MiG-21 kill of the conflict on 26 April 1966. Remaining with the 366th TFW into 1967, the aircraft was hit in the engines by AAA and shot down during a strafing attack on an ammunition dump at Thach Ban, ten miles north of the DMZ, on 6 August that year. It was being flown by 390th TFS crew Capt Albert Linwood and 1Lt Don Kemmerer ('GIB') at the time, both men perishing when their F-4 crashed into the sea.

5

F-4C-18-MC 63-7489 of Capt W J Swendner and 1Lt D A Buttell Jr, 480th TFS/35th TFW, Da Nang, July 1966

Amongst the first F-4Cs built for the USAF, this machine was delivered to the 12th TFW at MacDill AFB on 9 May 1964. It was moved to the 366th TFW's 390th TFS at Holloman AFB in May 1965, and accompanied the squadron to Da Nang on 4 November that same year. Here, the unit was controlled by the 6252nd TFW until the wing was replaced by the 35th TFW in April 1966. By then it was serving with the 480th TFS, and on 14 July 1966 Capt W J Swendner and 1Lt D A Buttell Jr claimed the unit's third MiG-21 kill. Reverting back to 390th TFS control later that year, 63-7489 was shot down on 27 December 1967 by AAA during an armed reconnaissance mission near Tho Ngoa. The crew managed to fly the crippled Phantom II out over the coast before they ejected, and pilot Maj H W Miller was rescued by a US Navy UH-2C. 'Back-seater' 1Lt S A Martin was lost in rough seas, however.

6

F-4C-24-MC 64-0838 of Maj P P Combies and 1Lt L R Dutton, 433rd TFS/8th TFW, Ubon RTAB, January 1967

Delivered to the 33rd TFW at Eglin AFB, Florida, on 22 October 1965, this aircraft was duly transferred to the 8th TFW's 433rd TFS on 6 June 1966. A participant in the 'Wolfpack's' hugely successful Operation *Bolo* offensive, the jet (crewed by Maj P P Combies and 1Lt L R Dutton) claimed the first of seven MiG-21s kill credited to the 8th TFW on 2 January 1967. Passed to the 366th TFW ten months later, it duly served with the 12th TFW (from March 1968), the 479th TFW (from March 1970), the 35th TFW (from October 1971) and then as a training aircraft with the 58th TFW/TTW from April 1977. 64-0838's final service was with the ANG's 110th TFS/131st TFW in Missouri and then the 114th TFS/142nd FIG in Oregon, where it was retired in July 1985. After several years in storage, the fighter was eventually put on display at the Alabama Space and Rocket Museum in 1988.

7

F-4C-22-MC 64-0720 of Capt J B Stone and 1Lt C P Dunnegan Jr, 433rd TFS/8th TFW, Ubon RTAB, January 1967

Another Operation *Bolo* veteran, 64-0720 was delivered new to the 8th TFW at George AFB on 22 May 1965 and deployed to Korat RTAB on 27 August 1965. Here, it flew with the 555th (FY codes) and 497th (FP) TFSs, as well as the 433rd TFS, with whom it claimed a MiG-21 on 2 January 1967. This profile shows the jet in its *Bolo* fit, complete with an all-important AN/ALQ-71 jamming pod on the outer right wing pylon. 64-0720 suffered a compressor first stage disc failure on the runway at Ubon RTAB on 28 April 1967, the resulting explosion forcing the crew to abort their take-off in the fully bombed-up jet. Fire then took hold of the 'wounded' F-4 and detonated one of the bombs, totally destroying it. Fortunately, the crew had successfully abandoned the aircraft by then.

8

F-4C-21-MC 63-7680 of Col R Olds and 1Lt C Clifton, 555th TFS/8th TFW, Ubon RTAB, January 1967

Delivered to the 8th TFW on 30 January 1965, this aircraft was deployed to Ubon RTAB on 2 September 1965 and flown in-country by the 555th (FP) and 433rd (FG) TFSs. On 2 January 1967 it was used by 8th FG CO Col Robin Olds to claim a MiG-21 destroyed during Operation *Bolo*. More success came 63-7680's way on 13 May 1967 when Lt Col F A Haeffner and 1Lt M R Bever of the 433rd TFS downed a MiG-17. Transferred to the 366th TFW several months later, the double MiG killer was shot down by AAA on 20 November 1967 during a 480th TFS attack on a SAM site located five miles north of the DMZ. Aircraft commander, Capt J M Martin died in the crash, but 1Lt James Badley was successfully recovered after ejecting.

9

F-4C-21-MC 63-7683 of Capt W S Radeker and 1Lt J E Murray, 555th TFS/8th TFW, Ubon RTAB, January 1967

Delivered to the 8th TFW on 30 December 1964, this aircraft deployed to South-East Asia on 18 December 1965 and flew in combat with the 433rd (FG), 555th (FY) and 497th TFSs (FP). Yet another MiG-21 killer on 2 January 1967, 63-7683 was duly handed over to the 366th TFW on 13 October 1967 for service with the wing's 480th TFS (CC). Later, it went to the 41st AD (GL) in January 1968, the 347th TFW later that month and the 12th TFW in June 1968. Following a spell with the 475th TFW from July 1968, it returned to the 12th TFW in May 1969, then served with the 479th TFW from December 1969 and the 35th TFW from October 1971. Passed on to the ANG, it saw service with the 170th TFS/183rd TFG in Illinois from April 1972 until transferred to the Oregon-based 123rd FIS/142nd FIG in May 1981. Consigned to the AMARC 'boneyard' in October 1989, the veteran fighter was retrieved from storage in March 1995 and shipped to Chile for display in the Los Serillos Museum.

10

F-4C-21-MC 63-7710 of Capt E T Raspberry and 1Lt R W Western, 555th TFS/8th TFW, Ubon RTAB, January 1967

Supplied new to the 8th TFW on 12 February 1965 and deployed to Ubon RTAB on 2 September that same year, this F-4C saw action with the 555th (coded FY) and 497th (FP) TFSs. Used by Capt E T Raspberry and 1Lt R W Western to claim a MiG-21 kill on 2 January 1967, it crashed on 12 June 1967 (the third F-4C lost on this day) shortly after taking off from Ubon when total hydraulic failure forced the crew to eject.

11

F-4C-19-MC 63-7589 of 1Lt R F Wetterhahn and 1Lt J K Sharp, 555th TFS/8th TFW, Ubon RTAB, January 1967

Another Operation *Bolo* MiG killer, this aircraft was originally delivered to the 15th TFW at MacDill on 11 September 1964. From here it transferred to the 390th TFS/366th TFW on 17 April 1965, and it was sent to South-East Asia with the squadron. Serving initially within the 6252nd TFW and then the 35th TFW, both at Da Nang, the jet was passed on to the 555th TFS/8th TFW (FY) on 14 June 1966. Transferred to the 356th TFS/39th AD (UK) on 4 October 1967, 63-7589 eventually wound up with the 475th TFW. Relegated to a training role, it was used by the 4453rd CCTW (DM) from December 1969 and then the 58th TFW (LA). Moving to Iceland with Air Defense Command in the mid 1970s, 63-7589 was used by the 57th FIS from 20 August 1975. Completing its USAF service with the Air Defense Weapons Center at Tyndall AFB, Florida, on 17 May 1978, the aircraft was duly passed on to the ANG. Spells with the 171st FIS/191st FIG in Michigan (from March 1979) and the

111th FIS/147th FIG in Texas (from October 1982) completed the jet's flying career, and it was placed in storage at AMARC on 21 January 1987. Here the Phantom II remained until 22 April 1991, when it was one of twelve F-4Cs trucked to Tolicha Peak, Nevada, for use as a range target.

12

F-4C-24-MC 64-0839 of Capt R M Pascoe and 1Lt N E Wells, 555th TFS/8th TFW, Ubon RTAB, January 1967

This Phantom II was delivered to the 33rd TFW on 27 October 1965, and it remained in Florida when passed on to the MacDill-based 4453rd CCTW in early July 1966. Several weeks later it was transferred to the 479th TFW at George AFB, before returning to the 4453rd CCTW on 18 August 1966. Sent to Ubon as an attrition replacement for the 8th TFW on 10 November 1966, the jet's crew of Capt R M Pascoe and 1Lt N E Wells claimed a MiG-21 on 6 January 1967 during Operation *Bolo*. Transferred to the 433rd TFS soon after this mission, 64-0839 was finally felled by AAA during a large-scale attack on Thai Nguyen iron and steel plant on 10 March 1967. Although holed by flak, the fighter remained airworthy long enough for its pilot, future MiG killer Capt J R Pardo, to push damaged F-4C 63-7653 to safety over Thailand in an incident later known as 'Pardo's Push'. When the fuel tanks in 64-0839 finally ran dry (by which time the port engine was also on fire), the crews from both F-4s successfully ejected over Laos and were quickly retrieved by two USAF HH-3Es search and rescue helicopters.

13

F-4C-24-MC 64-0849 of Maj T M Hirsch and 1Lt R J Strasswimmer, 555th TFS/8th TFW, Ubon RTAB, January 1967

The second 555th TFS MiG-21 killer of 6 January 1967, this aircraft was delivered to the 15th TFW on 10 November 1965. Transferred to the 8th TFW in October 1966, it arrived at Ubon via Strategic Air Command's 3960th SW at Andersen AFB, Guam, on the 29th of that month. After flying with the 555th for several months, the jet was passed on to the 497th TFS (FP), where it remained until downed by an SA-2 missile on 26 March 1967 during an attack on the North Vietnamese Army barracks at Son Tay. Lt Col F A Crow and 1Lt H P Fowler, both from the 433rd TFS, ejected into captivity.

14

F-4C-21-MC 63-7668 of Col R Olds and 1Lt W D Lafever, 555th TFS/8th TFW, Ubon RTAB, May 1967

This aircraft was delivered new to the 8th TFW on 18 January 1965 and deployed to Korat RTAB on 27 August 1965 with the 555th TFS (FY codes). 'Wolfpack' CO Col Robin Olds claimed his second MiG kill with the jet on 4 May 1967, 63-7668 being depicted here in its mission fit (with an ex-F-105 ECM pod on its right outer wing pylon) on this day.

Following service with the 497th TFS (FP), the fighter was handed over to the 366th TFW at Da Nang on 4 October 1967. Taken on charge by the 390th TFS, the F-4 was subsequently hit by 37 mm AAA three miles south of Dong Hoi during a coastal target attack on 27 January 1968. Coaxed back towards Da Nang by its crew (Maj R W Phillips and 1Lt B R Core), the jet was eventually abandoned off the South Vietnamese coast. A waiting USAF rescue helicopter retrieved both pilots just minutes after they had parachuted into the water.

15

F-4C-21-MC 64-0660 of Maj J A Hargrove and 1Lt S H Demuth, 480th TFS/366th TFW, Da Nang, May 1967

Triple MiG killer 64-0660 was delivered new to the 366th TFW at Holloman AFB on 19 February 1965, this aircraft first seeing combat with the 390th TFS/35th TFW from May 1966. It duly claimed the squadron's first MiG kill on the 12th of that month when Maj W R Dudley and 1Lt I Kringelis destroyed a MiG-17. Transferred to the 480th TFS/366th TFW the following year, 64-0660 was credited with the first F-4 SUU-16 gun pod MiG kill on 14 May 1967 whilst being flown by Maj J A Hargrove and 1Lt S H Demuth. Three weeks later, on 5 June, the fighter got its third victory when Maj D K Priester and Capt J E Pankhurst also shot down a MiG-17 with an SUU-16 pod. Sent to Misawa AB, Japan, in January 1968 for use by the newly-formed 39th AD's 356th TFS (UK), the jet also operated with the 41st AD's 35th TFS (GG) and the 347th TFW during the course of 1968. Returned to the USA in January 1970, the fighter was assigned to the 479th TFW in January 1970 and then the 58th TFW (LA) between 1972-77. Relegated to ANG duty in 1982, 64-0660 was flown by the New York-based 136th FIS/107th FIG until 1986, when it was put on display within the ANG compound at Niagara Falls International Airport, in New York.

16

F-4C-21-MC 63-7704 of Capt J T Craig and 1Lt J T Talley, 480th TFS/366th TFW, Da Nang, May 1967

Delivered to the 366th TFW on 10 March 1965, this F-4 was passed on to the 6252nd TFW (redesignated the 35th TFW) at Da Nang in October 1966. Re-acquired by the 366th TFW on 10 October 1966 following yet another round of redesignations, the jet was used by Capt J T Craig and 1Lt J T Talley to destroy a MiG-17 on 14 May 1967. As with a number of war-weary 366th TFW F-4Cs, it was transferred to the 39th AD's 356th TFS (UK) in October 1967. Ownership then passed to the 475th TFW in January 1968, followed by the 12th TFW's 558th TFS (XT) between December 1969 and March 1970. 63-7704 remained in TAC service for much of the 1970s, flying with the 347th TFW (GR) in 1970, the 18th TFW (ZG) in March 1971, the 35th TFW (GA) in July 1975 and finally

the 58th TFTW/TTW from late 1975 until 1977. Passed on to the ANG, the F-4 flew with the Louisiana-based 122nd TFS/159th TFG from July 1979 until sent to Oregon in December 1985 to end its days with the 114th TFS/142nd FIG. Retired to AMARC on 2 March 1987, 63-7704 was retrieved from storage in March 1992 and restored for display within the ANG facility at General Mitchell International Airport in Milwaukee, Wisconsin – the fighter was unveiled in October 1995.

17

F-4C-24-MC 64-0829 of Col R Olds and 1Lt S B Croker, 433rd TFS/8th TFW, Ubon RTAB, May 1967

This aircraft was used by Col Olds and 1Lt Croker to claim a pair of MiG on 20 May 1967, two victory markings being painted onto the port splitter plate immediately after the mission. The name *SCAT XXVII* (continuing a series of *SCAT*-named aircraft flown by Col Olds stretching back to World War 2) appeared on its nose in September 1967. At the time of its MiG kills, the jet carried only the 'Satan's Angels' squadron insignia on its nose, as seen in this profile. 64-0829's long USAF career began with its delivery to the 33rd TFW on 28 October 1965, where the fighter remained until transferred to the 8th TFW in February 1967 for service with the 433rd TFS. It then moved, along with a handful of other ex-'Wolfpack' F-4Cs, to the Cam Ranh Bay-based 12th TFW at the end of 1967, serving with the 557th and 558th TFSs. Returning to the USA in early 1970, it was sent to the 479th TFW's 4535th CCTS (GA) in March of that year, after which it served with the 35th TFW from October 1971. Following Periodic Depot Maintenance at Ogden AMA in 1971, 64-0829 was issued to USAF's 81st TFW at RAF Bentwaters in February 1972, flying with the 91st TFS (WS and later WR codes). It joined the 401st TFW (TJ) at Torrejon, Spain, in September 1973, and was subsequently reassigned to the USAF Reserve-manned 93rd TFS/915th TFG (FM) at Homestead AFB, Florida, from September 1979. After final service with the Texas ANG's 182nd TFS/149th TFG (SA), commencing in 1983, the aircraft was restored to a semblance of its 'Wolfpack' markings and put on display within the USAF Museum at Wright-Patterson AFB, Ohio, in 1987.

18

F-4C-20-MC 63-7623 of Maj J R Pardo and 1Lt S A Wayne, 433rd TFS/8th TFW, Ubon RTAB, May 1967

Delivered to the 8th TFW on 4 November 1964, this aircraft was deployed with the wing to Ubon RTAB on 2 September 1965. Whilst in-theatre, the jet served with the 433rd (FG), 555th (FY) and 497th (FP) TFSs. Its moment of glory came on 20 May 1967 when Maj J R Pardo and 1Lt S A Wayne used it to claim a MiG-17 kill (one of six MiGs destroyed by USAF F-4s on this day). Moving to the 39th AD's 356th TFS (UK) on 4 October 1967, 63-7623 was later taken on charge by the 475th TFW in

January 1968. It was then employed as a pilot trainer, firstly with the 4453rd CCTW (DM codes) in December 1969, followed by the 58th TFTW/TTW from August 1971 through to April 1977. Redelivered to PACAF, the fighter flew with the Kadena-based 18th TFW (ZZ) from April 1978, before returning to the USA for ANG service with the Indiana-based 113th TFS/181st TFG (HF) from August 1979. Retired in 1987, the aircraft was initially displayed at Chanute TTC, Illinois, in March 1988, before being moved to Fairmount, Indiana, in April 1995.

19

F-4C-22-MC 64-0673 of Maj P P Combies and 1Lt D L Lafferty, 433rd TFS/8th TFW, Ubon RTAB, May 1967

Another 20 May 1967 'Wolfpack' MiG killer, this aircraft was initially delivered to the 391st TFS/366th TFW on 18 March 1965. The jet went into combat with the 12th TFW in January 1966, and remained in-theatre after its transfer to the 8th TFW on 19 May 1967 – within 24 hours of its arrival at Ubon, 64-0673 had been used by Maj P P Combies and 1Lt D L Lafferty to down a MiG-17. A second spell with the 366th TFW began on 13 October 1967, followed by further service with the 12th TFW from February 1968 – the latter included time with the 557th TFS (XC). After four years of constant combat, the Phantom II was posted to Yokota AB, Japan, in February 1970 for service with the 347th TFW, followed by a transfer to the 18th TFW's Kadena-based 44th TFS (ZL) in May 1971. Returning to the USA, and the 35th TFW (GA), in July 1975, 64-0673 was eventually handed over to the ANG in 1979, with whom it saw service with the Louisiana-based 122nd TFS/159th TFG until 1985. The veteran fighter was then passed on to the 114th TFS/142nd FIG in Oregon, from where it was retired to AMARC on 16 April 1987. Four months later the Phantom II was moved to nearby Pima Air Museum, in Tucson, and put on public display.

20

F-4C-23-MC 64-0776 of Lt Col R F Titus and 1Lt M Zimer, 389th TFS/366th TFW, Da Nang, May 1967

Delivered new to the 33rd TFW on 30 July 1965, this aircraft was transferred to the 389th TFS/366th TFW on 4 March 1966 and taken by the wing to Phan Rang Bay, South Vietnam, later that same month. Having claimed its first MiG on 23 April 1967 with Maj R D Anderson and Capt F D Kjer, 64-0776 was used by Lt Col R F Titus and 1Lt M Zimer to down their second and third victories (both MiG-21s) on 22 May 1967. The crew's previous success (also a MiG-21) had come just 48 hours earlier in F-4C 64-0777. Remaining in PACAF, the aircraft later flew with the 347th TFW from 13 March 1968 and the 18th TFW's 67th TFS (ZG) from 15 March 1971. ANG service then followed with the Illinois-based 170th TFS/183rd TFG (1975-80) and the 123rd FIS/142nd FIG in

Oregon until retirement in 1989. The triple MiG killer was put on display at Camp Withycombe, in Oregon, in November of that same year, before being moved to Portland International Airport, again in Oregon, in February 1993, and finally to the Museum of Flight in Seattle, Washington, in April 1996.

21

F-4C-20-MC 63-7647 of Maj R M Pascoe and Capt N E Wells, 555th TFS/8th TFW, Ubon RTAB, June 1967

This aircraft claimed the very last MiG kill by an F-4C on 5 June 1967 whilst being flown by Maj R M Pascoe and Capt N E Wells. It was delivered to the 8th TFW on 14 November 1964 and deployed to Korat RTAB with the wing on 27 August 1965. Transferred to the 35th TFW on 2 August 1966, the jet reverted back to 8th TFW control on 29 September 1966, where it flew with both the 555th (FY) and 497th (FP) TFSs. Passed to the 366th TFW on 26 June 1967, 63-7647 saw further combat with the 389th TFS, using the individual tail-code AC. More PACAF service followed with the 35th TFS (GG) of the 41st AD from 21 November 1967, the 347th TFW from January 1968 and finally the 18th TFW's 44th TFS (ZL). Joining the latter unit on 7 May 1971, it transferred to the wing's 67th TFS (ZG) in January 1975, with whom it eventually adopted the 18th TFW's ZZ codes. The fighter's final service was with the ANG's Hawaii-based 199th TFS/154th CG from 1978 through to 1987, and then the 114th TFS/142nd FIG in Oregon from June of that year until its retirement to the Oregon Air and Space Museum in October 1989.

22

F-4D-29-MC 66-0249 of Maj E T Raspberry and Capt F M Gullick, 555th TFS/8th TFW, Ubon RTAB, June 1967

This aircraft claimed the first MiG kill for an F-4D on 5 June 1967 whilst being flown by Maj E T Raspberry and Capt F M Gullick. Delivered to the 8th TFW in May 1967, the fighter survived a wheels-up landing at Ubon whilst with the 433rd TFS after suffering severe AAA damage that saw its radome and radar shot away – its 'GIB' also ejected. Following extensive repairs, the jet enjoyed a second spell with the 555th TFS (OY codes), which was now part of the 432nd TRW, from June 1971 until 1974. It was then passed on to the 48th TFW (LN) at RAF Lakenheath, where the fighter remained until 1977. The F-4 then returned to the USA for service with the 474th TFW at Nellis AFB. The wing converted to the F-16A/B in 1982, and 60-0249 moved to the 31st TTW at Homestead. It was still serving with the wing when it was lost on 22 March 1985 over the Gulf of Mexico, its crew successfully ejecting.

23

F-4D-32-MC 66-8719 of Capt D D Baker USMC and 1Lt J D Ryan Jr, 13th TFS/432nd TRW, Udorn RTAB, December 1967

Previously depicted incorrectly in profile in *Osprey Combat Aircraft 26 – US Navy F-4 MiG Killers 1965-70*, this aircraft was used by USMC exchange pilot Capt D D Baker and 'GIB' 1Lt John D Ryan to claim the 432nd TRW's first MiG kill. 66-8719 finished its military service with the USAF Reserve-manned 457th TFS/301st TFW at Carswell AFB, Texas, flying with the wing from 1981 until its retirement to AMARC on 3 January 1989. The jet remained in storage until August 1998 when, according to an 'unofficial source', it was moved to Avon Park, Florida, for use as a range target.

24

F-4D-30-MC 66-7601 of Maj J D Moore and 1Lt G H McKinney Jr, 435th TFS/8th TFW, Ubon RTAB, December 1967

Bearing MiG kill stars on its port vari-ramp from its previous victories on 6 November 1967 (when crewed by Capt D D Simmonds and 1Lt G H McKinney Jr), this aircraft claimed a third MiG six weeks later on 19 December with Maj J D Moore and 1Lt G H McKinney Jr at the controls. Originally delivered to the 33rd TFW on 11 May 1967, the near-new fighter was transferred to the 8th TFW two months later. Following a lengthy spell with the ex-F-104-equipped 435th TFS (FO), it was passed on to the 25th TFS (FA codes). 66-7601 was still flying with the unit when it was hit by an SA-2 missile north of the DMZ on 16 February 1972, forcing its crew, 350-mission veteran Capt W R Schwartfeger and Weapons Systems Officer (WSO) 1Lt R W Galati, to eject into captivity.

25

F-4D-30 MC 66-7594 of Lt Col C D Squier and 1Lt M D Muldoon, 435th TFS/8th TFW, Ubon RTAB, January 1968

Like a number of 8th TFW F-4Ds, this aircraft was delivered new to the 33rd TFW on 9 April 1967 and then transferred to the 'Wolfpack' in July of that year. It was used by Lt Col C D Squier and 1Lt M D Muldoon to down a MiG-21 on 3 January 1968, and was subsequently passed from the 435th (FO) to the 25th (FA) TFS. Further service was with the Korat-based 34th TFS (JJ) of the 388th TFW from 27 August 1974, the Holloman-based 49th TFW (HO) from 8 December 1975 and finally the 474th TFW (NA), in Nevada, from 27 October 1977. This Maverick missile-capable F-4D was written off in an accident on 28 August 1979 whilst still serving with the 474th.

26

F-4D-31-MC 66-7748 of Maj B J Bogoslofski and Capt R L Huskey, 433rd TFS/8th TFW, Ubon RTAB, January 1968

Like the F-4D seen in the previous profile, this machine downed a MiG-21 on 3 January 1968. It was being flown on this occasion by Maj B J Bogoslofski and Capt R L Huskey. 66-7748 was delivered directly to the 8th TFW at Ubon from the manufacturer on 27 September 1967, where it was adorned with the FG codes of the 433rd TFS.

Passed on to the 497th TFS (FP), the fighter was shot down at dawn on 5 November 1969 while leading a 'Night Owl' interdiction mission against communist supply convoys using roads in the Mu Gia and Ban Karai Passes in South Vietnam. Directing a pair of US Navy aircraft whilst acting as Forward Air Controllers, the F-4 was either hit by AAA or simply flown into the ground. Pilot Capts D P Lefever and WSO J Y Echanis were both killed.

27

F-4D-31-MC 66-8688 of Capt R H Boles and 1Lt R B Battista, 433rd TFS/8th TFW, Ubon RTAB, February 1968

Also delivered new to the 8th TFW in the autumn of 1967, this machine was issued to the 433rd TFS (FG) on 10 October 1967. When used by Capt R H Boles and 1Lt R B Battista to down a MiG-21 on 6 February 1968, the fighter was inexplicably marked with the FO codes of the 435th TFS. Later flown by the 555th TFS (FY), it was transferred with this unit to 432nd TRW control on 28 May 1968. Three months later, on 31 August, 66-8688, was shot down by AAA on a night attack mission against enemy trucks discovered on a mountain road 25 miles west of Dong Hoi. Pilot Capt J R Wilson succeeded in ejecting despite being badly wounded, but WSO 1Lt W L Kinkade was killed when the jet hit the ground. A dramatic, and successful, rescue attempt was made the following day, with Wilson being extracted by an HH-53 and on-scene rescue commander Lt Col William Jones (CO of the A-1 'Sandy'-equipped 602nd Special Operations Squadron) being awarded the Medal of Honor for bravery under fire.

Back cover

F-4D-31-MC 66-7661 of Col D O Williams and 1Lt J P Feighny Jr, 435th TFS/8th TFW, Ubon RTAB, February 1968

Initially delivered to the 33rd TFW on 26 June 1967, this aircraft was passed on to the 8th TFW three months later. Here, it flew with the 435th (FO) and 479th (FP) TFSs, before being transferred to the 523rd TFS (PN) of the 405th TFW at Clark AB, in the Philippines, on 25 November 1970. Remaining in PACAF, the jet was sent to the 36th TFS (UK) of the 3rd TFW at Kunsan AB, South Korea, in November 1972. The 3rd TFW was replaced at Kunsan by the 8th TFW (UP) on 16 September 1974, and 66-7661 served with the 'Wolfpack' until relegated to ANG service in December 1981 following the wing's re-equipment with F-16A/Bs. Issued to the District of Columbia-based 121st TFS/113th TFW (DC), the fighter flew from Andrews AFB until retired in September 1989. The MiG killer was initially put on display on the 113th TFW ramp in January 1990, before being mounted atop a pole within the ANG research centre compound at Andrews AFB in 1996.

COLOUR SECTION

1

The 45th TFS's main mission, like all USAF F-4 units, was bombing. This pair, loaded with M117s on inboard pylon TERs and centreline MERs, also carry AIM-7Ds. F-4C 64-0676 has interesting motifs on both its wing tanks and vari-ramp. Behind it is 64-0679, flown by Capt Tom Roberts and Ronald Anderson on the first USAF F-4 MiG killing encounter of the war

(Robert F Dorr Collection via Michael J France)

2

When Ubon's F-4Cs had camouflage hastily applied over their TAC grey paint, inadequate primer was used and it quickly peeled off, revealing the original markings. These machines were repainted correctly during 1967. F-4C-21-MC 64-0660, seen here in October 1966, had scored the first of its three MiG kills five months previously when flown by Maj Ray Dudley and 1Lt Emants Kringelis. It went on to score the first and last gun pod kills for the F-4C (via Peter Schinkelshoek)

3

F-4C-24-MC 64-0849 carries a red star for the MiG-21 kill claimed by Maj Tom Hirsch and 1Lt Roger Strasswimmer on 6 January 1967. The red Singhai lion on the rudder was a 555th TFS marking that pre-dated camouflage, and it was later adopted by the 497th TFS until mid-1967 when it was superseded by a white night owl stencil. The red stripe aft of the radome was also a 497th TFS sartorial addition, although black was the official squadron colour. Paintwork on the fin suggests over-painting of the 555th TFS FY codes, worn when the MiG kill was scored several weeks prior to this photograph being taken (via Peter Schinkelshoek)

4

This F-4C (63-7647) was flown by Maj Dick Pascoe and Capt Norm Wells when they destroyed a MiG-17 on 5 June 1967. The black band painted behind the radome tends to exaggerate its size. (Via Col Jack D Morris)

5

Capt Everett Raspberry's F-4C-21-MC shortly after his *Bolo* MiG-21 kill. 63-7710 has a replacement stabilator in white and its undersides also appear to be in the original gloss white finish (via Peter Schinkelshoek)

6

In this July 1968 photograph, F-4D 66-7750 displays Maj Kirk's MiG kill, the 433rd insignia on its flank, an over-painted tail flash, canopy décor and RHAW blisters. The jet returned to Thailand in 1972 for service with the 8th TFW and 432nd TRW after a brief period with the 49th TFW. A spell with USAFE's 50th and 52nd TFWs was then followed by time with the 474th TFW. The jet then flew with

the reserve-manned 507th TFG for eight years, before being transferred to the Republic of Korea Air Force in April 1988 as part of its fifth batch of F-4s (via *Peter Schinkelshoek*)

7

F-4C 64-0699 scored the first MiG kill for the 555th TFS and struck again on 14 May 1967 after being transferred to the 480th TFS at Da Nang. Between these assignments, it carried 497th TFS codes, as seen in March 1967. The fighter has 'curved' pylons with MAU-12/A ejector racks, while Ev Raspberry's MiG killer 63-7710 (left background) still has the straight-edged LAU-17/A inboard pylons. Both aircraft show extensively 'patched' paintwork. The third F-4C in this photograph, 64-0739, was also a MiG killer (via *Peter Schinkelshoek*)

8

Maj James Hargrove sprays a MiG kill symbol on F-4C-21-MC 64-0660 after scoring the first F-4 kill with a gun on 14 May 1967. This jet scored its second gun kill a few weeks later (*James Hargrove via Ben Backes*)

9

Capt Don Logeman celebrates his 100th mission North, flown in MiG killer 66-7546 *MR LUCKY*. Maj Gen Logeman explained to the author that, 'at the end of a combat tour the Ubon custom was to pop the bottle of champagne after de-planing, sample said champagne, then change uniform on the spot into a "Wolfpack" social flightsuit and finish off the champagne'. He flew his 100th mission with 1Lt Al Nacina because his MiG-killing partner, 1Lt Fred McCoy, had already returned to the USA post-tour. *MR LUCKY* has an SUU-23/A mounted on its centreline (*Maj Gen Don Logeman*)

10

By the time this photograph was taken in the late summer of 1967, Capt W S Radeker and 1Lt J E Murray's *Bolo* MiG killer F-4C 63-7683, formerly of the 8th TFW's 555th TFS, had acquired a 497th TFS white night owl stencil, nickname (on its all-white cabin air intake) and a spectacularly weathered paint scheme (via *Col Jack D Morris*)

11

GEORGIE GIRL (F-4C 63-7668) is seen here in January 1968, following its move to the 390th TFS/366th TFW at Da Nang. Its MiG kill and 497th TFS marking remain, but all previous tail markings have been obliterated to show BK codes, which was one of the 390th's individual identifiers. The BK code also adorned F-4C 64-0762 and F-4D 66-7738 at other times (via *Col Jack D Morris*)

12

F-4D 66-8719, a MiG killer for Capt Doyle Baker and 1Lt John Ryan, shows the mixed ordnance that became a common load for the multi-tasked F-4D. Aside from its eight 500-lb LDGP bombs, the jet

carries two AIM-4D Falcons, an asymmetric pair of AIM-7s and two AN/ALQ-87 ECM pods (*Col Doyle Baker via Peter B Mersky*)

13

F-4D-30-MC 66-7601, with its 2.5 MiG kills displayed, rolls out at the start of yet another mission from Ubon in August 1968. The jet had acquired the nickname *THE GUNNER* on its red cabin air intake and additional red trim (the 435th TFS colour) on its canopy and nose-gear door by the time this photograph was taken (*Tom Brewer via Col Ron Thurlow*)

14

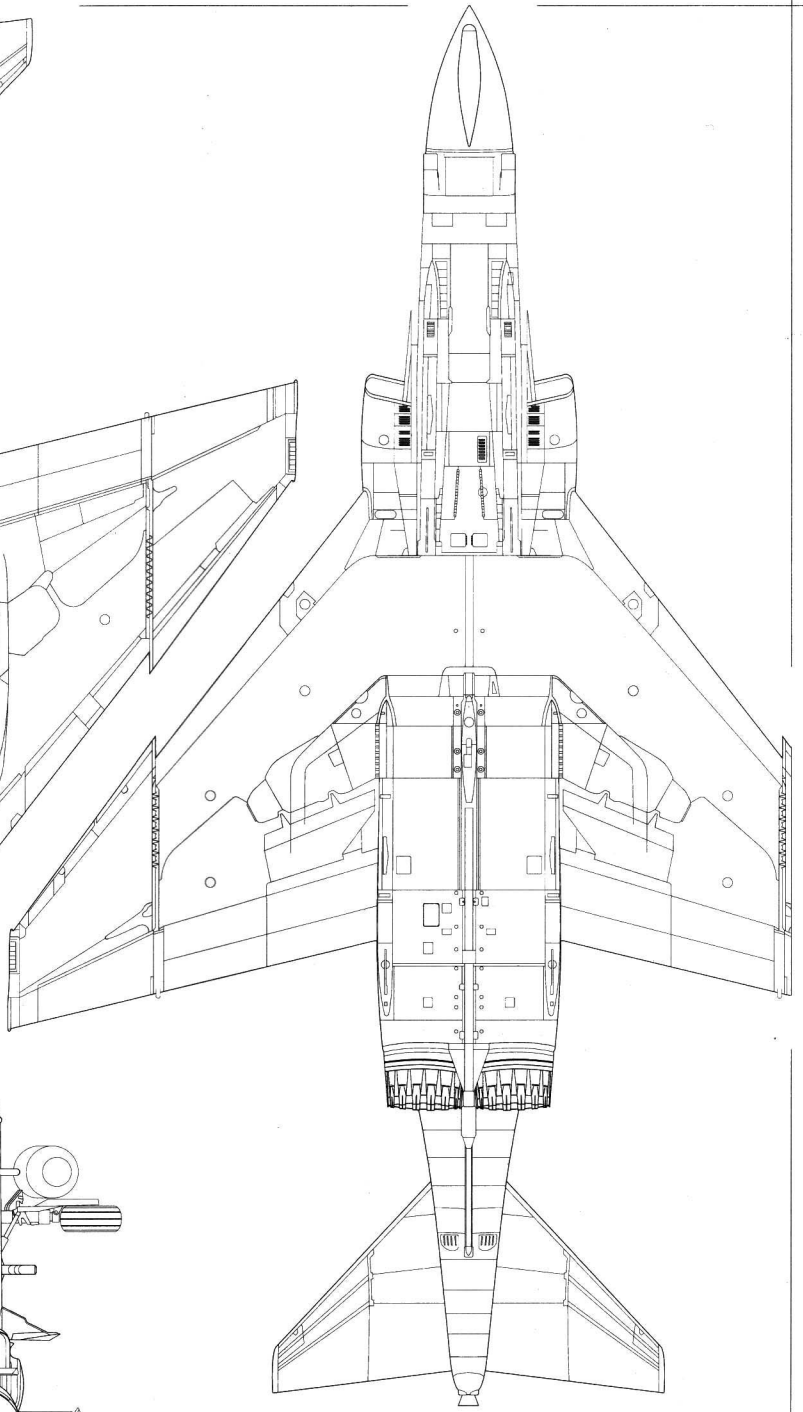
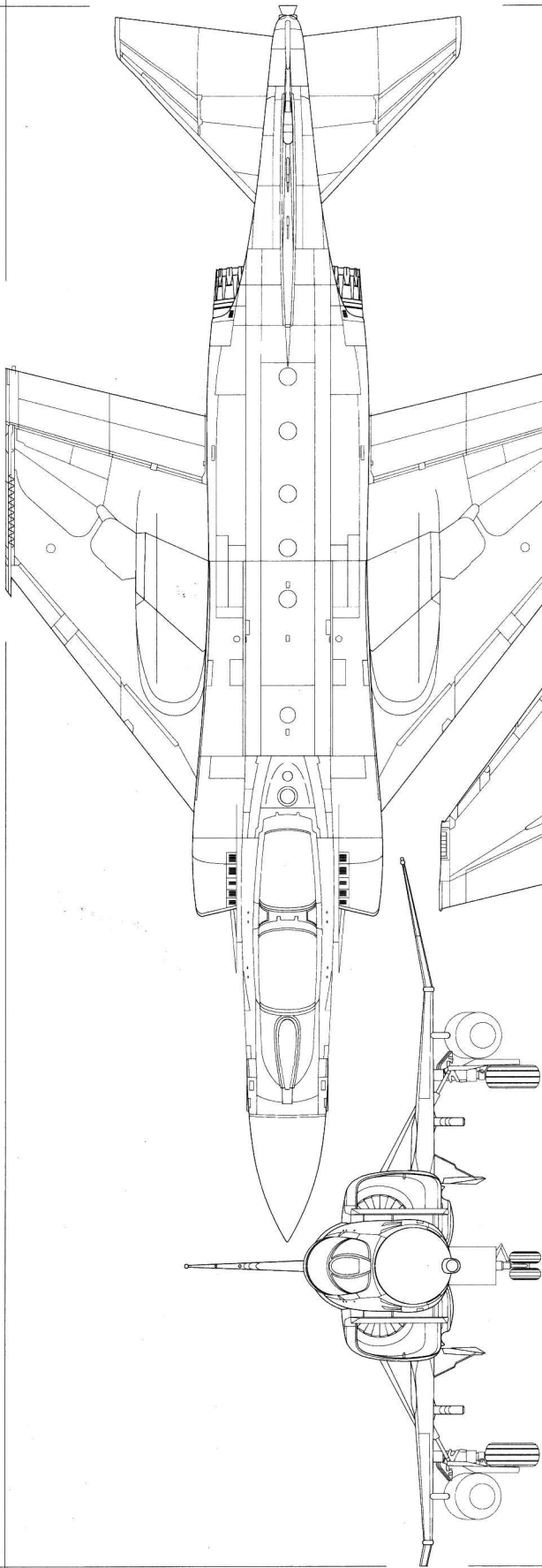
F-4D 66-7601 sits in its revetment with a full load of CBUs and AIM-7s in August 1971. The 435th TFS was originally assigned to Udorn RTAB as an F-104C squadron, transitioning onto the F-4Ds of the 4th TFS/33rd TFW from July 1967. George McKinney was back-seater for all three of 66-7601's MiG encounters. Recently repainted, the jet's 2.5 kill stars had not yet been re-applied (*Patrick Martin via Peter Schinkelshoek*)

15

Col D O Williams' F-4D 66-7661 in April 1968, just a few weeks after its 14 February MiG-17 shoot-down when flying as 'Killer 01'. Aside from being marked up with a red star, the jet has also seen red paint applied to its cabin air intake and RHAW blisters affixed to its nose since the St Valentine's Day shoot down (*USAF via Peter Schinkelshoek*)

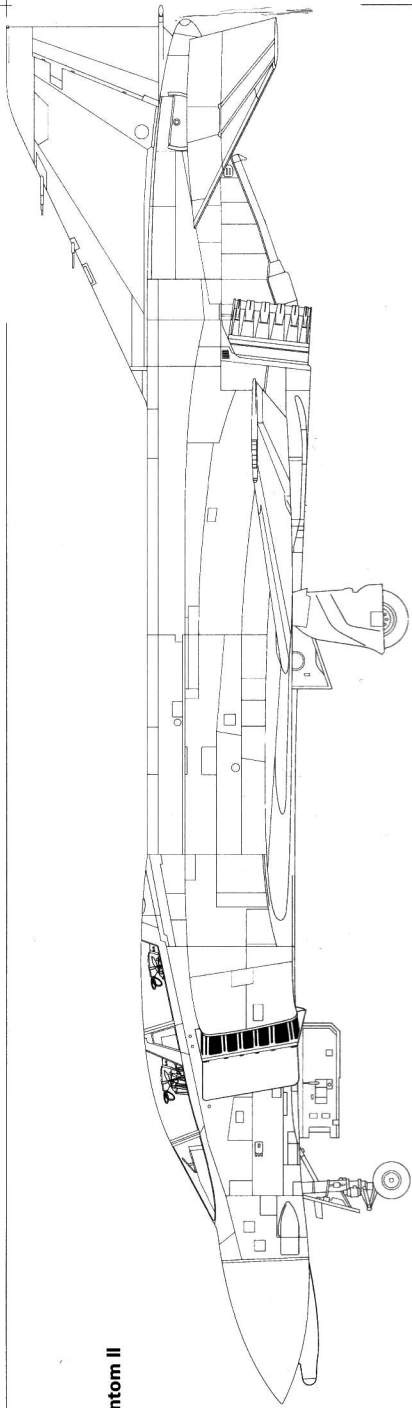
16

A close-up of F-4D-30-MC 66-7554 *TRAPPER* at Udorn on 2 August 1971, showing its 14 February 1968 kill and a second victory that was transferred from another aircraft and pilot (*Larsen/Remington Collection via Richard L Ward*)

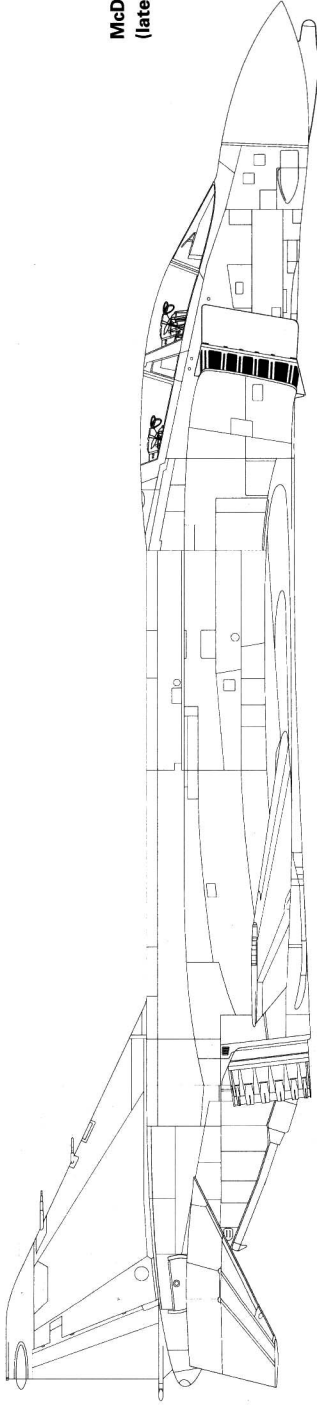


All drawings on this page are of a McDonnell Douglas F-4C Phantom II, and are to 1/96th scale, as are the drawings opposite

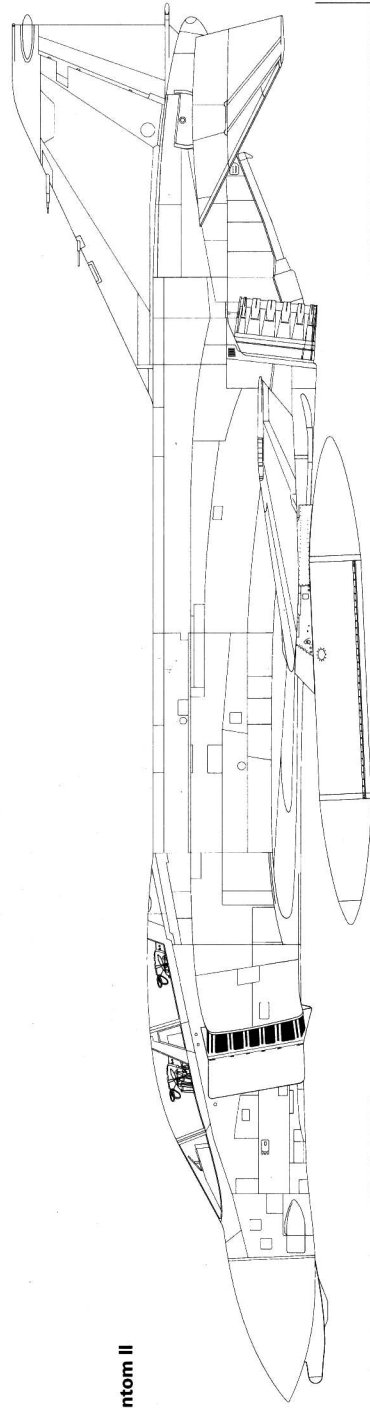
**McDonnell Douglas F-4C Phantom II
(early build)**



**McDonnell Douglas F-4C Phantom II
(late build)**



McDonnell Douglas F-4D Phantom II



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**USAF F-4 PHANTOM II MiG KILLERS 1965–68**

After unsuccessfully deploying F-100 Super Sabre fighters to protect its strike aircraft over North Vietnam, the USAF introduced the F-4C Phantom II to the war in April 1965. At this stage the USAF's *Feather Duster* evaluation gave pessimistic forecasts of the F-4's likely performance in combat against the MiG-17 and MiG-21. Although the first MiG kills were not made until 10 July 1965, the F-4C/D soon became the Air Force's principal fighter over the North, destroying 85 MiGs by the close of 1968. Sixteen Phantom IIs were acknowledged losses to MiGs during that time. This

book describes how a gunless naval interceptor became a viable USAF opponent to the more nimble MiGs. It also explains how the Air Force gradually followed US Navy initiatives in the use of the F-4's missile armament, but employed very different tactics and aircrew training. The story of the disappointing AIM-4 Falcon missile and the 'band-aid' gun pod solution to the lack of an internal cannon are also discussed. There are many accounts of MiG engagements, using first-hand interviews with the aircrews involved wherever possible, as well as recently-declassified USAF documentation.

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ISBN 1-84176-656-9



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